Water Supply
Asset Management Plan
2018

Creating a living environment

TENTERFIELD SHIRE COUNCIL

Document Control	Asset Management for Small, Rural or Remote Communities 
Document ID: Water Supply Asset Management Plan August 2018.docx	

Rev No	Date	Revision Details	Author	Reviewer	Approver
1.01	31/05/2013	Final Adopted by Council 26/06/2013 (213/13)	Deanne Eaton Manager Water & Waste	Dennis Gascoigne Director Engineering Services	Dennis Gascoigne Director Engineering Services
2.01	04/01/2017	Revision Draft	R. Conroy Hydrosphere Consulting	R. Campbell Hydrosphere Consulting	Not approved
3.01	04/07/2018	Review to comply with OLG NSW Integrated Planning & Reporting Framework, updated costing schedules, risk management changes, register updates, all tables & graphs updated & narrative rewritten	David Ward Acting Manager Assets & Project Planning	Andre Kompler Chief Operating Officer	Andre Kompler Chief Operating Officer
4.01	28/11/2018	Final Adopted by Council 28/11/18 (Res No. 265/18)	David Ward Acting Manager Assets & Project Planning	Andre Kompler Chief Operating Officer	Andre Kompler Chief Operating Officer

International Infrastructure Management Manual (IIMM), the *Asset Management Guidelines for Water Supply and Sewerage Schemes* and the *Condition Assessment & Asset Performance Guidelines*.

The Institute of Public Works Engineering Australia IPWEA).

www.ipwea.org.au

Table of Contents

List of Tables

List of Figures

1. Executive Summary

1.1. Review of Water Supply Asset Management Plan 2013 & Draft 2017

The Shire's initial Water Supply Asset Management Plan (WSAMP) was developed in 2013 and Hydrosphere Consulting were engaged in 2016 to undertake a review and rewrite, which resulted in a new draft dated January 2017. In May 2017, AssetVal undertook a revaluation of the water supply assets.

In preparation for the Review of the WSAMP 2013 & draft 2017 was the development of a review analysis:

The WSAMP 2018 document has the following changes incorporated into the WSAMP 2017 version:

1. The Plan has been rewritten to comply with the Office of Local Government NSW (OLG) Integrated Planning and Reporting Framework and to align with all of the other Shire published documents:

   https://www.tenterfield.nsw.gov.au/council/council-documents/plans-and-reports/integrated-planning-reporting-2018

   - Community Engagement Strategy (TSC:2017)
   - Community Strategic Plan 2017-2027 (TSC: 2017)
   - Delivery Program 2017-2021 (TSC:2017)
   - Operational Plan 2018-2019 (TSC:2018)
   - Workforce Management Strategy 2017-2021(TSC:2017)
   - Long Term Financial Plan 2017-2027 (TSC:2017)
   - Asset Management Strategy 2017-2027 (TSC:2017)
   - Water Supply Asset Management Plan 2013 (TSC:2013)
   - Draft Water Supply Asset Management Plan (Hydro: 2016)
   - Strategic Business Plan for Water Supply & Sewerage Services (Hydro: 2015)

2. An asset management document flow chart has been developed to understand the connectivity of the Shire's documents to the OLG Framework.
3. A raft of updates, changes, revisions and actions as determined by the instructing review analysis have been incorporated into the 2018 version.
4. The community consultation section has been updated to reflect the recent 2018 community survey results.
5. All of the financial analysis has been reviewed and updated to align with the Delivery Program 2017-21, Operational Plan 2018-19, Long Term Financial Plan 2017-27 (LTFP), Asset Management Strategy 2017-27 (AMS) and the 20-18-19 budget working financial analysis document.
6. Valuations have been updated to reflect the May 2017 Revaluation by AssetVal.
7. Updated the risk section to align with the current Shire adopted practice.
8. Updated the improvement plan.

1.2. Context

From the Community Strategic Plan 2017 (p23) the environmental goal is to ensure: *'Secure, sustainable and environmentally sound infrastructure and services underpin Council service delivery.'*

The Shire's strategies to achieve this goal include:

- A total water cycle management approach including water conservation and reuse is implemented;
- Water is used carefully in Council's buildings, parks, sporting grounds and daily operations.

The measures for these strategies includes:

- A 100% drinking water quality compliance with microbiological requirements;
- A decrease in annual residential water consumption.

The main issue the Shire faces in the medium term in the management of the water supply assets will be the refurbishment or replacement of the Tenterfield Water Treatment Plant, the finalisation of the Tenterfield dam wall reconstruction and the Jennings dam wall project

Due to limited resources the Shire prioritises the upgrade of assets and construction of new assets as a low priority, focusing instead on regulatory compliance, maintenance and renewal to support a modest level of service to meet the current and future needs of the community.

1.3. The water supply network

This water asset management plan relates to the water infrastructure within the townships of Tenterfield, Jennings and Urbenville as these constitute the areas serviced within the Shire.
The water service comprises:

- Water supply dam at Tenterfield
- Water treatment plants

- reticulation network
- reservoirs
- pump stations
- valves and hydrants

These infrastructure assets are within the townships of Tenterfield, Jennings and Urbenville with a replacement value of $45.6 Million.

1.4. What does it cost

The projected cost to provide the services covered by the Water Supply Asset Management Plan including operations, maintenance, renewal and upgrade of existing assets over the 10 year planning period 2017-27 Asset Management Strategy p24 (TSC: 2017)is about $19.1 million or $1.9 million per year.

Estimated available funding for this period is $14 Million or $1.4 Million on average per year which is 71.8% of the cost to provide the service. This is a funding shortfall of $5.5Million attributable to the new Tenterfield Water Treatment Plant, which will not proceed within the 10 year planning window without Government Funding. Projected expenditure required to provide services in the WSAMP compared with planned expenditure currently included in the Long Term Financial Plan.

1.5. What the Shire does

The Shire provides Water Supply services by:

- Consulting with the community through the Community Engagement Plan 2017 and adopting the environmental goals listed in the Community Strategic Plan 2017.
- Operation, maintenance and renewal of water supply assets to meet service levels set by the Shire in the Delivery Program 2017-2021 and the annual Operational Plans to fit available resources and funding.
- Subject to funding within the 10 year planning period, which is additional to what is currently received refurbish or replace the Tenterfield Water Treatment Plant.

1.6. What the Shire cannot do

The Shire does not have enough funding to replace all old pipework under programmed maintenance. It is noted the Shire has bolstered the funding of this program compared to projected LTFP forecast.

1.7. Managing the Risks

There are risks associated with providing the service and not being able to complete all identified activities and projects. The identified major risks as:

- Public health
- Continuity of supply
- Discoloured water

The Shire will endeavour to manage these risks within available funding by:

- Maintaining operational standards
- Upgrading the Tenterfield WTP
- Renewing treatment operations in line with new technology and chemicals
- Renewing mains when breakages occur

1.8. The next steps

The actions resulting from this Asset Management Plan are:

- Commitment to design and replacement or refurbishment of the Tenterfield Water Treatment Plant;
- Maintain operating processes to deliver water to public health requirements;
- Upgrade equipment as technology advancements warrant it;
- Seek out options for additional State and Federal government water supply infrastructure grants;
- Improve the quality of renewal and maintenance project identification and prioritisation through updates to condition rating systems;
- Improvements in construction practice and quality assurance;
- Implement changes in technology, which translate to more cost effective maintenance and renewal outcomes;

1.9. What is the asset management plan

Asset management planning is a comprehensive process to ensure delivery of infrastructure services is provided in a financially sustainable manner.

This asset management plan covers the infrastructure assets serving the Tenterfield, Jennings and Urbenville community's needs. These assets include the water supply dam, the water treatment plants and the reticulation systems to enable the community areas to enjoy clean potable water to regulated standards.

The Plan details information about the infrastructure assets including actions required to provide an agreed level of service in the most cost effective manner. The

Plan defines the services to be provided, how the services are provided and what funds are required to provide the services.

1.10. Why is there a funding shortfall

Most of the Shire's water supply network was constructed by developers and from government grants, often provided and accepted without consideration of ongoing operations, maintenance and replacement needs.

Many of these assets are approaching the later years of their life and require replacement, services from the assets are decreasing and maintenance costs are increasing.

The present funding levels are nearly sufficient to continue to provide existing services at current levels in the medium term.

1.11. What options are available to the Shire

To reduce the funding gap shortfall the Shire needs to address the following:

- Improve asset knowledge so data accurately records the asset inventory, how assets are performing and asset life to anticipate their inability to provide the required service levels;
- Improve the efficiency in constructing new asset, whilst operating, maintaining and replacing existing assets to optimise life cycle costs;
- Identify and manage risks associated with providing infrastructure services;
- Adopting a fit for purpose approach to service levels and infrastructure to ensure the community receives the best return from infrastructure assets;
- Consult with the community to ensure water supply services are affordable and meets community needs;
- Develop collaborative partnerships or business arrangements with third parties to provide services;
- Seek additional funding from the State and Federal governments and other authorities to foster a 'whole of government' funding approach to water supply services.

1.12. What may happen if the funding shortfall is not reduced

It is likely the Shire will have to reduce service levels in some areas, unless new sources of revenue are found. For water, the service level reduction may include permanent and more severe water restrictions.

1.13. What can the Shire do

The Shire can develop options, costs and priorities for future water services, consult with the community to plan future services to match the community service needs with ability to pay for services and maximise community benefits against costs.

1.14. What can the Community do

The Shire welcomes Community engagement and response on this Asset Management Plan. Suggestions on how the Shire may change or reduce its water supply services to ensure the appropriate level of service can be provided within available funding constraints.

2. Introduction

2.1. Council context

Council's mission:

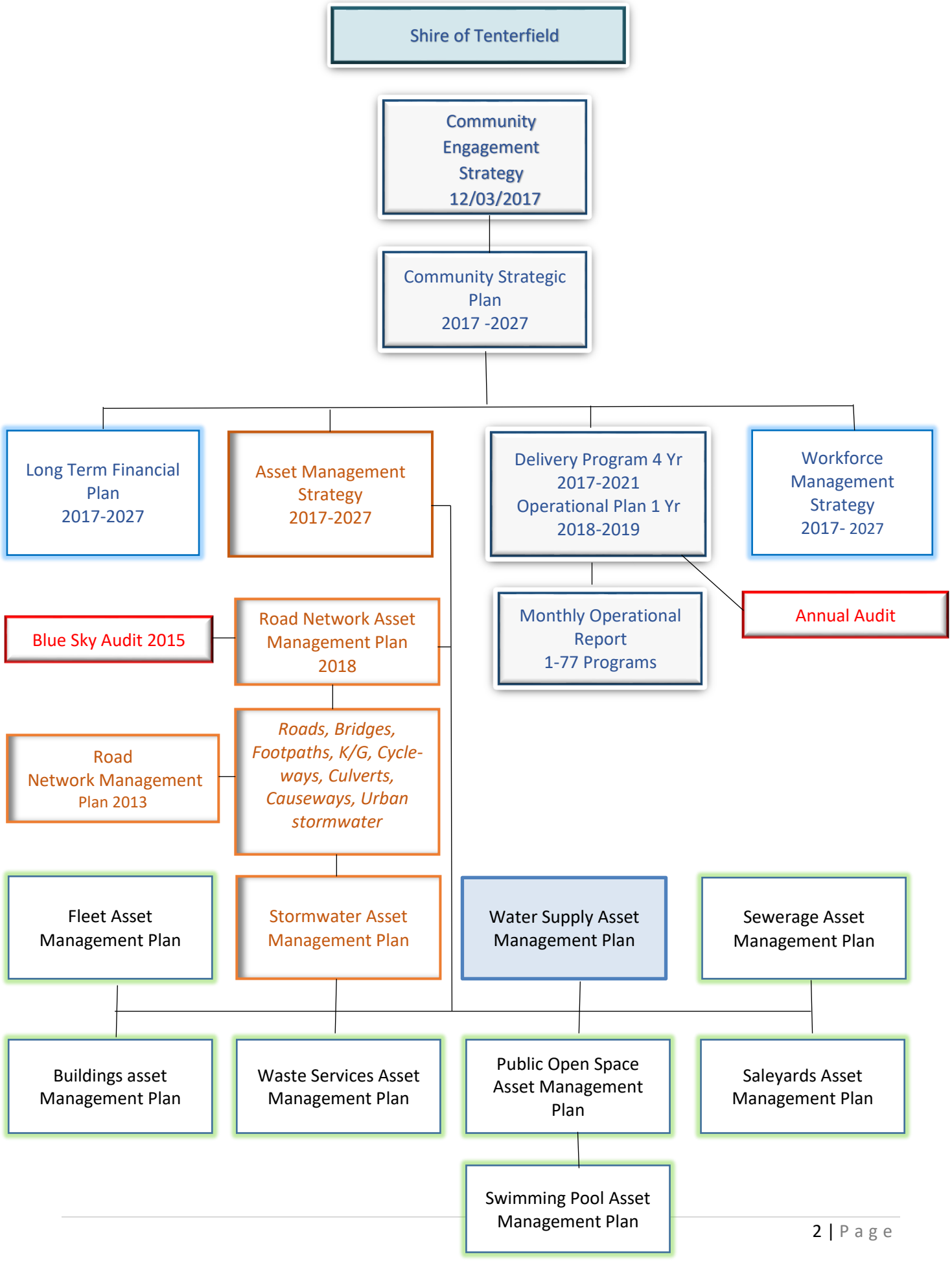
"Quality Nature, Quality Heritage, Quality Lifestyle" provides focus and direction in the manner in which Council provides leadership and services.

Council's vision:

- To establish a Shire where the environment will be protected and enhanced to ensure sustainability and inter-generational equity;
- To recognise and actively develop our cultural strengths and unique heritage;
- To establish a prosperous Shire through balanced, sustainable economic growth managed in a way to create quality lifestyles and satisfy the employment, environmental and social aims of the community;
- To establish a community spirit which encourages a quality lifestyle, supports health and social well-being, promotes family life and lifestyle choices;
- To establish a community spirit which promotes opportunities to participate in sport and recreation, promotes equal access to all services and facilities; and
- To encourage all people to participate in the economic and social life of the community with a supportive attitude towards equal life chances and equal opportunity for access to the Shire's resources.

The Shire's sixteen (16) primary goals encapsulated in the Community Strategic Plan 2017-27 and cover the themes of community, economy, environment, leadership and transport. Fundamentally they are all interrelated and the water supply theme is one of the underlying planks supporting the other themes within the supply areas. All urban centres are reliant on the water supply asset system.

The Shire has in place the Integrated Planning and Reporting Framework and associated strategies and plans:


Shire of Tenterfield
Community Engagement Strategy 12/03/2017
Community Strategic Plan 2017 -2027
Long Term Financial Plan 2017-2027
Asset Management Strategy 2017-2027
Delivery Program 4 Yr 2017-2021 Operational Plan 1 Yr 2018-2019
Workforce Management Strategy 2017- 2027
Blue Sky Audit 2015
Road Network Asset Management Plan 2018
Monthly Operational Report 1-77 Programs
Annual Audit
Road Network Management Plan 2013
Roads, Bridges, Footpaths, K/G, Cycle-ways, Culverts, Causeways, Urban stormwater
Fleet Asset Management Plan
Stormwater Asset Management Plan
Water Supply Asset Management Plan
Sewerage Asset Management Plan
Buildings asset Management Plan
Waste Services Asset Management Plan
Public Open Space Asset Management Plan
Saleyards Asset Management Plan
Swimming Pool Asset Management Plan

Council's mission statement is a key driver of water supply strategic planning and for the provision of water supply services and the Shire will strive to:

- Provide water meeting the quality standards and environmental licence requirements in order to protect public health and the environment;
- Operate, maintain and administer the water supply system efficiently, whilst meeting adopted levels of service in order to provide value-for-money to customers;
- Incorporate ecological sustainable development principles into all system planning and operations to become environmentally responsible; and
- Engage with customers in decision-making processes to provide ownership and satisfaction with the service provided.

From the Community Strategic Plan 2017 (p23) the environmental goal is to ensure: *'Secure, sustainable and environmentally sound infrastructure and services underpin Council service delivery.'*

The Shire's strategies to achieve this goal include:

- A total water cycle management approach including water conservation and reuse is implemented;
- Water is used carefully in Council's buildings, parks, sporting grounds and daily operations.

The measures for these strategies includes:

- A 100% drinking water quality compliance with microbiological requirements;
- A decrease in annual residential water consumption.

The Water Supply Asset Management Plan (WSAMP) 2018 is an integral part of the Shire's overall Integrated Planning and Reporting Framework shown above and as prescribed by the OLG and is part of the following strategies, plans, valuation audits and data repositories:

- Integrated Planning & Reporting Framework Office of Local Government
- Integrated Planning & Reporting Manual for Local Government In NSW -2013
- Community Engagement Strategy (TSC:2017)
- Community Strategic Plan 2017-2027 (TSC: 2017)
- Delivery Program 2017-2021 (TSC:2017)
- Operational Plan 2018-2019 (TSC:2018)
- Workforce Management Strategy 2017-2021(TSC:2017)
- Long Term Financial Plan 2017-2027 (TSC:2017)
- Asset Management Strategy 2017-2027 (TSC:2017)
- Water Supply Asset Management Plan (TSC: 2013)
- Draft Water Supply Asset Management Plan (Hydro: 2017)
- Strategic Business Plan for Water Supply and Sewerage Services (Hydro: 2015)
- Water Conservation and Demand Management Plan (TSC: 2010)
- Tenterfield WTO Concept Design (MME: 2016)
- Water Supply Assets Revaluation (AssetVal: 2017)
- Shire of Tenterfield LEP
- MapInfo Spatial Asset Register
- Asset Data Spreadsheets in N:\drive

This Plan (WSAMP 2018) is integrally linked to the Strategic Business Plan for Water Supply & Sewerage (Hydro: 2015), which details the guidance for the future management of the water supply business overall. This Plan demonstrates responsible management of assets and services provided to ensure compliance with regulatory requirements and discusses the funding levels needed to provide the adopted levels of service.

2.2. Background for Plan

The Community considers the Shire contains many areas of natural beauty straddling the Great Dividing Range and the headwaters of the Clarence River. The natural environment forms the basis of the Shire's economic prosperity, supports recreational activity and is vital to health and well-being. The Shire is has a high level of biodiversity with a large proportion of endemic and threatened species unique to the area. (Community Strategic Plan p22:2017).

The aspirational goals of the community is to ensure the natural environment is protected, enhanced and promoted into the future, environmental risks and impacts are managed; and *service delivery is underpinned by secure, sustainable and environmentally sound infrastructure and services.* These are further supported by ensuing the Shire assets are managed now and in the long term to meet the needs of the community (Community Strategic Plan p23:2017). Relevant goals and objectives and how these are addressed in this Plan are shown in Table 2.1.

Table 2-1: Organisation goals and how these are addressed in this WSAMP

Goal / Objective	How Goal and Objectives are addressed in AMP
Sustainability and inter-generational equity	The long term costs of asset management and maintenance are determined and spread across their life span. This allows planning for acceptable levels of service and allocation of resources to ensure functioning assets with the cost not disproportionally allocated to future generations.
Establish a prosperous shire with quality lifestyle and economic development	The true cost of assets and their useful life is identified. Key assets are prioritised and realistic levels of service established.
Quality environment with secure, sustainable and environmentally sound infrastructure and services	The water supply asset is key to sustaining the community through environmentally sound infrastructure and services. This Plan identifies long term asset capital works and maintenance requirements for improvements to ensure the service is maintained into the future in line with the Strategic Business Plan for Water Supply (Hydro: 2015)

Tenterfield was gazetted in 1851 as it developed along High Street near the intersection of the New England Highway and the Bruxner Highway to the east. The opening of the railway in 1884 resulted in development of near the railway. The Tenterfield Water Treatment Plant was erected in 1930 with the original water reticulation system installed consisting of vitrified clay (VC) and asbestos cement (AC) pipes. Prior to 1980 network extensions were continued in the same pipe materials. From the 1980's network extension have been laid with PVC piping.

Urbenville was established in the 1860's at the time of the gold rush nearby and proclaimed in 1912. The Urbenville reticulation and water pumping station was established in the 1960's. A new Water Treatment Plant was commissioned in 2009. The Urbenville Water Treatment plant also supplies water to Woodenbong and Muli Muli.

The Jennings village is supplied water from Southern Downs Regional Council. The reticulation system was constructed in 1950 with further extensions occurring since then.

The infrastructure assets covered by this asset management plan are shown in Table 2.2 and are listed in the Valuation Schedule (AssetVal: 2017) attached.

The schedule identifies the attributes of : location, asset description, asset class, asset component, material, replacement material, construction year, quantity, size, units, current and gross replacement costs, asset ID, useful life, remaining life, Fair Value, accumulated depreciation, annual depreciation.

It is noted there are no inspection dates or condition ratings listed as these task have not been undertaken.

Table 2-2: Assets covered by this WSAMP

Asset category	Dimension	Replacement Value * $M
Water mains – Tenterfield > 150mm dia	264,680m	$ 1,570
Reticulation – Tenterfield < 150mm dia	300,061m	$7,983
Bore - Tenterfield	1	$141
Pump stations	20	$851
WTP - Tenterfield	1	$4,663
Dam - Tenterfield	1	$22,132
Reservoirs - Tenterfield	1	$2,876
Water mains – Urbenville > 150mm dia	8,287m	$1,465
Reticulation – Urbenville < 150mm dia	2,989m	$893
Raw water supply – Urbenville	1	$161
Reservoir - Urbenville	1	$550
WTP - Urbenville	1	$1,790
Water mains - Jennings	1,248m	$221
Reticulation - Jennings	2,100m	$307
Total		$45,603

* **Replacement value as determined in valuation of water supply assets by AssetVal 2017**

2.3. Asset Management Objectives

The Shire's strategic asset management framework brings together the inter-relationships between key strategic and corporate planning activities and operational asset management. This allows the Shire's strategic goals to be integrated with the asset portfolio to meet the Shire's program delivery requirements and established community service levels determined through the development of the Community Strategic Plan (Asset Management Strategy 2017-27 p6).

The key strategic aspirations for this WSAMP are:

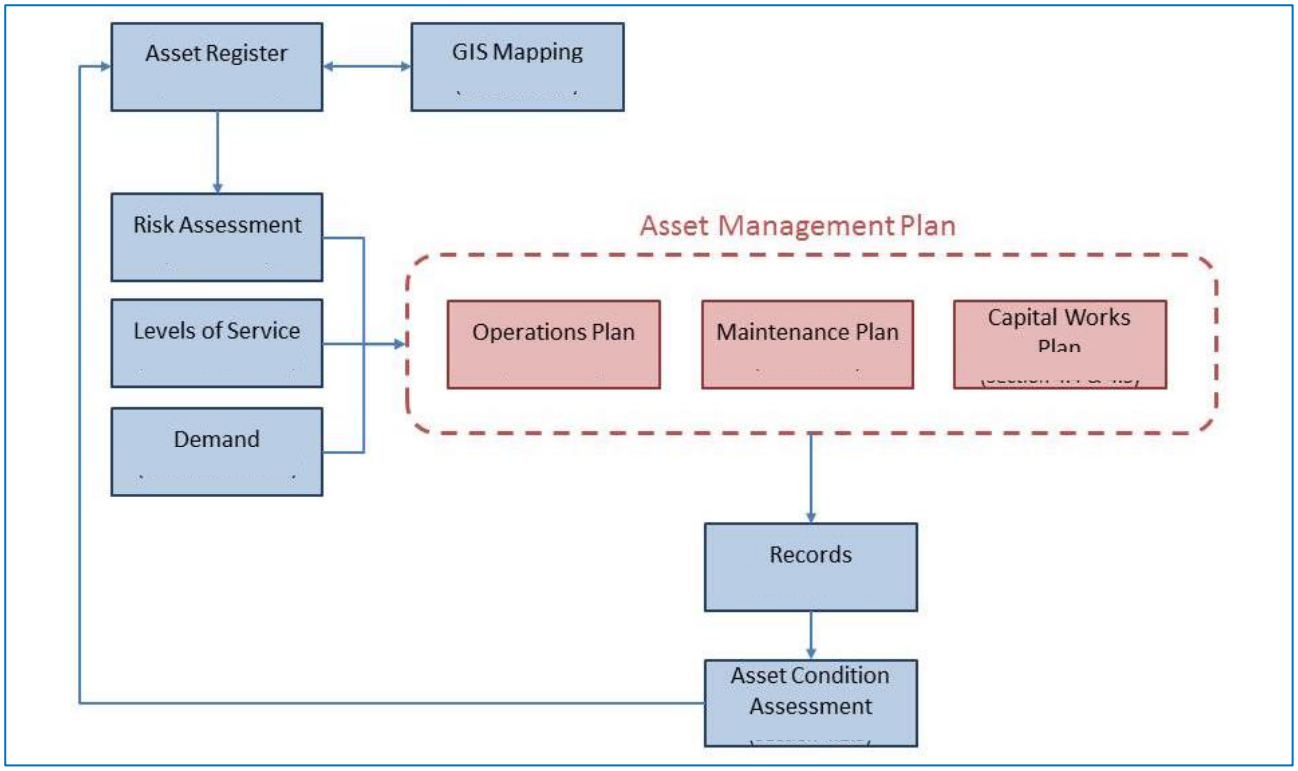
- Manage water supply assets through the continuous updating of the Strategic Business Plan for Water Supply;
- Through the Community Strategic Plan 2017-27 and the Long-Term Financial Plan 2017-27 ensure future funding needs are identified, affordable, agreed and allocated so the assets meet the defined levels of service required by the community;
- Record assets and collect data in accordance with the appropriate accounting standards, reporting requirements, internal asset information protocols and procedures; and
- Maintain water supply asset condition information system with all physical attributes, technical details, life cycle data, performance and costings.

The key elements of infrastructure asset management are:

- Taking a life cycle approach;
- Developing cost-effective management strategies for the long term;
- Providing a defined level of service and monitoring performance;
- Understanding and meeting the demands of growth through demand management and infrastructure investment;
- Managing risks associated with asset failures;
- Sustainable use of physical resources; and
- Continuous improvement in asset management practices.

To achieve the objectives of this WSAMP all key framework components in Figure 2-1 including asset - information, condition, documentation, levels of service, risks and records need to be addressed and are essential to this plan. Each key component identifying the actions required and the time frame to implement are outlined in the improvement/action plan located in Section 8.1

Figure 2- 1: Asset Management Framework



The Shire provides water supply services to its community by infrastructure assets. The Shire has acquired infrastructure assets by 'purchase', by contract, construction by staff and assets constructed by developers and others to meet increased levels of service. Council's goal in managing infrastructure assets is to meet the required level of service in the most cost effective manner for the present and future consumers.

The objectives for this WSAMP 2018 are a subset of the Asset Management Strategy 2017-27 and are outlined in Table 2-3.

Table 2-3: Goals & objectives of this WSAMP

Goal/Objectives	How goals and objectives are addressed
Document the services/service levels to be provided and the costs of providing the service.	The accurate documentation of all water supply assets and their current condition data will provide information on services/service levels and the cost of maintaining this service. This will be achieved by implementing the actions within each of the following sections: ▪ GIS Mapping (Section 5.1.1); ▪ Field Documentation (Section 5.1.1); ▪ Asset Register (Section 5.1.1); ▪ Condition Assessment (Section 5.1.8); ▪ Risk Assessment (Section 5.2); ▪ Financial Planning (Section 5.3.1); ▪ Asset Management System (Section 7.2).

Goal/Objectives	How goals and objectives are addressed
Communicate the consequences for service levels and risk, where desired funding is not available.	Adequate documentation and assessment of water supply assets will provide the data required to identify and communicate the consequences for service levels and risk, where the Shire may not have the funding to improve the condition of certain assets. This will be achieved by developing, reviewing and updating assessment criteria and communicating consequences, as outlined in the following sections: ▪ Condition Assessment (Section 5.1.8); ▪ Risk Assessment (Section 5.2);
Provide information to assist in balancing service levels, costs and risks to provide services in a financially sustainable manner.	Developing and improving documentation and assessments of water supply assets will assist the Shire in providing this service in a financially stable manner. This will be achieved as outlined in the following sections: ▪ GIS Mapping (Section 5.1.1); ▪ Field Documentation (Section 5.1.1); ▪ Asset Register (Section 5.1.1); ▪ Condition Assessment (Section 5.1.8); ▪ Risk Assessment (Section 5.2); ▪ Asset Management System (Section 7.2).
Develop a water supply WSAMP to address key water infrastructure requirements.	This WSAMP 2018 achieves the desired outcome by addressing the verification of asset data, the review and improvement of detailed maintenance, operation, upgrade and financial plans identifying key infrastructure requirements for providing and maintaining a suitable level of water supply service. This will be achieved by: ▪ Completion of the improvement/action plan outlined (Section 8.0).

2.4. Plan framework

Key elements of the Plan are:

- Levels of service – specifies the services and levels of service to be provided by the Shire;
- Future demand – how this will impact on future service delivery and how this is to be met;
- Life cycle management – how the Shire will manage its existing and future assets to provide the required services;
- Financial summary – what funds are required to provide the required services;
- Asset management practices;
- Monitoring – how the plan will be monitored to ensure it is meeting the organisation's objectives; and
- Asset management improvement plan.

This WSAMP has been prepared in accordance with the *International Infrastructure Management Manual* (IIMM), the *Asset Management Guidelines for Water Supply and Sewerage Schemes* and the *Condition Assessment & Asset Performance Guidelines*. It should be noted certain key elements of this Plan cannot be finalised until many of the actions listed in Table 2-3 and the improvement/action plan in Section 8.1, are implemented or completed. Many of these actions hinge on the acquisition and implementation of a new automated asset management system linked to a GIS system.

2.5. Community consultation

The initial version of the Water Supply Asset Management Plan adopted by Council on 26 June 2013 (Resolution 213/13), incorporates community consultation undertaken from November 2012 to January 2013 on infrastructure and service levels. The consultation assisted Council and the community in matching the level of service needed by the community, service risks and consequences with the community's capacity to pay for the desired level of service.

No community consultation was undertaken for the Draft 2017 version of the WSAMP. A Community Satisfaction Survey was undertaken by Council in early 2015 and as it was not specific to infrastructure and service levels and was not considered in the 2017 Draft WSAMP (Hydro: 2016).

However, the results of a recent community satisfaction survey undertaken by IRIS Research (Report: June 2018) during March/April 2018 demonstrated customer satisfaction stayed at the same level or improved marginally since 2015. The open ended responses focussed on water quality and improvements to supply.

3. Levels of service

3.1. Customer Research and Expectations

The Shire completed a "road show" late in 2012 presenting the challenges facing the Shire in maintaining and improving assets. As part of this process was a paper based survey mailed to every Shire resident, along with an online option. This enabled the determination of the service expectations and level of understanding regarding asset management.

In completing the surveys, the community ranked water assets as the 3rd most important component in Tenterfield Shire's asset portfolio behind road maintenance and upgrades of gravel road.

3.2. Legislative Requirements

Council has to meet many legislative requirements including Australian and State legislation and State regulations. The most significant of the relevant legislation is shown in Table 3.1.

Table 3-1: Legislative requirements

Legislation	Summary of Related Requirements
Local Government Act, 1993 and Local Government (General) Regulation 2005	This Act provides the legal framework for the system of local government in NSW. Under the Local Government Act, 1993, the responsibility for provision of water supply and sewerage services in non-metropolitan NSW is delegated to local councils. The Shire is the local water utility responsible for water supply and sewerage provision in TSC local government area (LGA). The Shire provides bulk treated water to Kyogle Shire from the Urbenville water supply. Southern Downs Regional Council (Queensland) provides treated water to Jennings. The Minister for Primary Industries has significant powers under the Act for construction and approval of water supply and sewerage works and emergency management works.
Local Government Amendment (Planning and Reporting) Act 2009	Local Government Amendment (Planning and Reporting) Act 2009 includes the preparation of a long term financial plan supported by AMPs for sustainable service delivery.
Local Government (Water Services) Regulation,1999	The Regulation supplements the provisions of the Local Government Act 1993 relating to the carrying out of water supply, sewerage and stormwater drainage works by councils and regulates the use of such works.
Environmental Planning and Assessment (EP&A) Act, 1979	The Act requires all proposals, activities and functions which are investigated, designed, planned, constructed and operated should be studied during all stages of their environmental impact on the basis of scale, location and performance. Environmental impact assessments may also be required to satisfy Commonwealth legislation processes. The Act provides the basis for the preparation of environmental planning instruments.
Dams Safety Act, 1978	The Dams Safety Committee (DSC) operates under the Act. The DSC's statutory role is to ensure the safety of dams and their storage reservoirs in order to adequately protect the interests of the community. Dam owners are required to comply with the Australian National Committee on Large Dams (ANCOLD) Guidelines on the Consequence Categories for Dams (September 2012).

Public Health Act, 2010	This Act commenced in 2012, replacing the Public Health Act, 1991. The Act requires drinking water suppliers to establish and adhere to a quality assurance program that complies with the Regulation and gives NSW Health powers with respect to the provision of safe drinking water. The Act was amended to mandate compliance with the "health critical" elements of the Australian Drinking Water Guidelines in regional NSW.
Protection of the Environment Operations Act, 1997	Councils and private businesses are required to exercise due diligence to avoid environmental impact.
Water Management Act, 2000	This Act provides for the sustainable and integrated management of the water sources of NSW. The Act provides a framework for water sharing plans and environmental flows, sets out bulk water supply regimes, defines local water utility access licences and requires water utilities to levy developer charges.
Water Act, 1912	In those water sources (rivers, lakes and groundwater aquifers) in NSW where water sharing plans have not commenced, the Water Act 1912 governs the issue of new water licences and the trade of water licences and allocations.
Fluoridation of Public Works Supplies Act, 1957	This Act, together with the Fluoridation of Public Water Supplies Regulation, 2002 and the Code of Practice for the Fluoridation of Public Water Supplies, 2002, requires NSW Health approval to add fluoride to a public water supply by a water supply authority.
Occupational Health and Safety Act 2000 and Rehabilitation Act 1987	The Acts places emphasis on risk management and consultation with staff to minimise work related accidents and health impacts. Council needs to train staff in safety issues and provide a safe working environment and supply equipment to ensure safety. Council and Council's officers may be liable for breaches of these requirements.
Fisheries Management Act, 1994	The objects of this Act are to conserve, develop and share the fishery resources of NSW for the benefit of present and future generations. Often works associated with water supply structures including dams, weirs, pipelines and extraction points involve works that trigger certain approval requirements under the Act.
The Australian Accounting Standards	The Australian Accounting Standards Board Standard, AASB 116 Property Plant & Equipment. This standard requires assets be valued and reported in the annual accounts, including depreciation value of assets.

3.3. Current levels of service

Community Levels of Service shown in Table 3-2, measure how the community receives the service and whether the organisation is providing community value. Community levels of service measures used in the WSAMP are:

- Quality - How good is the service?
- Function - Does it meet users' needs?
- Capacity/Utilisation - Is the service over or under used?

Supporting the community service levels are operational or technical measures of performance. These technical measures relate to the allocation of resources to service activities the organisation undertakes to best achieve the desired community outcomes and demonstrate effective organisational performance.

Technical levels of service measures shown in Table 3-2 are linked to annual budgets covering:

- Operations – the regular activities to provide services such as treating and pumping water, and sampling and testing to ensure water quality;
- Maintenance – the activities necessary to retain an assets as near as practicable to an appropriate service condition such as mains flushing, mains break repairs and pump repairs;

- Renewal – the activities returning the service capability of an asset up to which it was originally such as valve and hydrant replacement, mains replacement and reservoir lining; and
- Upgrade – the activities to provide a higher level of service (e.g. solar panels) or a new service not previously existing such as a house connection and water mains extension.

Table 3-2: Current levels of service

Measure	Objective	Measurement Process	Target	Current Performance
Legislative Requirement				
Compliance	Compliance with ADWG 2011	Sampling results	100% compliance	100% compliance
Community Levels of Service				
Quantity	Acceptable taste and odour	Customer complaints	< 10 p.a.	0
Quantity	Normal demand is met	Metered consumption	Peak day demand: 2,000 L/dwelling/day Average annual residential demand: 190 kL/property/a	150 kL/residential
	Minimise drought restrictions	Maximum frequency of restrictions	5 times per 10 years	
		Maximum duration of restrictions	10 months/10 year period	
		Ability to supply demand through the worst drought on record	90% of water demand (i.e. a 10% reduction in consumption)	
Function	Continuity of supply	Planned interruptions - Notice given to customers (between 9am and 4pm)	2 weeks (95% of time)	2 weeks
		Unplanned interruptions – maximum duration	< 4 hours	<4 hours
		Unplanned interruptions – maximum interruptions to supply	40 per 1,000 properties p.a.	
		Main breaks	25 per 100 km main p.a.	
	Appropriate water pressure	Customer complaints	Minimum 12 m head except for existing high level zones Maximum static pressure 90 m head (when conveying maximum instantaneous demand of 6 L/min)	On target
Safety	No public health incidents	NSW Health notifications	Nil	Nil
Technical Levels of Service				
Function	Service is available to all urban areas	Availability of service	All residential and non-residential properties within the defined service area	95 %

Measure	Objective	Measurement Process	Target	Current Performance
Availability	Minimise loss of supply	Response Time (time to have staff onsite or to investigate a problem or answer an enquiry)	Priority 1: A complete failure to maintain continuity of supply to large number of customers or critical user at critical time: Repairs to commence within 0.5 hour (during work hours) and within 1 hour (after work hours)	<0.5 hours
Safety	No downstream flooding due to dam wall failure	Dam safety requirements are met.	Dam safety upgrade completed by 2018/19.	On target

3.4. Desired levels of service

The Community's desired levels of service are identified through a combination of community consultation, residents' feedback to Councillors and staff, service requests and correspondence. The broad community expectations are summarised in the Community Strategic Plan 2017-27 with specific expectations identified annually in each yearly Operational Plan.

4. Future demand

4.1. Demand forecast

Factors affecting demand include population change, changes in demographics, seasonal factors, vehicle ownership, consumer preferences and expectations, economic factors, agricultural practices, employment participation and environmental awareness. There is expected to be little change in demand due to population changes. The Shire's population has decreased from 6,811 (2011) to 6,628 (2016) in 5 years (ABS) and this is reflected in the population in Tenterfield, Drake, Urbenville and other villages also exhibiting decreasing or stable populations. The non-urban/village population has continued to stabilise over the period. Demand factor trends and impacts on service delivery are summarised in Table 4-1.

Table 4-1: Demand factors, projections and impact on community

Demand factor	Position 2016	Projection 2026	Potential Impact
Population	6,628	7500	On-going focus on maintenance and renewal of existing assets
Urban population	3,496	3750	No significant impact
Water supply connections – Tenterfield	1,840	2,049	Not significant
Annual demand (ML/a) – Tenterfield	356	382	Secure yield (970 ML/a) is predicted to be sufficient to supply the long-term demand
Peak day demand (kL/d) – Tenterfield	2,438	3,000	Current WTP capacity of 3,500 kL/d is predicted to be sufficient to supply the long-term demand. The proposed WTP upgrade will meet the peak demand for the long-term.
Water supply connections – Urbenville	155	173	Not significant
Annual demand (ML/a) – Tenterfield	84.3	95	Secure yield (205 ML/a) is predicted to be sufficient to supply the long-term demand

Source: Hydrosphere Consulting (2013) & MJM Environmental (2015) – Projected peak demand.

The Shire adopted a Water Conservation and Demand Management Plan in June 2010 to supplement the Drought Management Plan (TSC: 2010), which has been reviewed with a June 2018 version. The measures aimed to reduce the community's total water usage levels during both drought and non-drought periods and increase the security of the water supply systems.

Total demand has decreased over the last 10 years despite a slight increase in the number of connections, particularly in Tenterfield (Hydrosphere Consulting, 2015). The consumption data for the communities of Urbenville and Jennings suggests the water usage volumes are significantly lower than the Tenterfield community. This is predominantly due to the majority of houses in these communities using rainwater tanks as an alternate source of water.

The long-term water supply demand in Tenterfield was estimated as part of the Integrated Water Management Strategy (IWCM) (Hydrosphere Consulting, 2013) based on 0.9% p.a. growth in connections over the next 20 years. A review of current and predicted future peak day demand and the capacity of Tenterfield WTP was undertaken as part of the study into options for upgrade of the WTP. The capacity of Tenterfield WTP is predicted to be sufficient for the planning horizon. The Shire is currently investigating options for upgrade of the Tenterfield WTP. The combined capacity of the Tenterfield reservoirs is 4.4 ML and are considered to be sufficient to satisfy peak day demand into the long-term.

The long-term water supply demand in Urbenville, Woodenbong and Muli Muli is also based on 0.9% p.a. growth in connections over the next 20 years.

The current level of residential demand is considered to be at a sustainable level based on benchmarking against other Local Water Utilities (Hydrosphere Consulting, 2015). In addition, the assessed secure yield of Tenterfield and Urbenville water supplies suggest there will be sufficient water available for the long-term. The existing demand management measures (BASIX, best-practice pricing) are considered to be appropriate.

Climate change may impact on the water supply system in Tenterfield and Urbenville even though both are designed to cope with a moderate increase in population. However, drought events will stretch the system and may result in severe water restrictions. It is an imperative to ensure the system is capable of processing sufficient water to meet demand. Services may no longer perform as well in drought conditions or large rainfall events following droughts.

4.2. Changes in technology

Technology changes forecast to affect the delivery of services covered by this plan are detailed in Table 4-2.

Table 4-2: Changes in technology and effect on service delivery

Technology Change	Effect on Service Delivery
Social media and internet connectivity	Improvements in communication in the event of emergencies
Increased use of GPS	Improved asset identification/location for maintenance, monitoring and emergency response
Water treatment technology	New technologies will result in better treatment options for water
Operations	Improved systems for water meter reading and greater automation of systems
Materials used to manufacture water mains and pipes	New technologies resulting in increased lifespan and decrease maintenance requirements for water mains and pipes

4.3. Demand management planning

Demand for new services will be managed through a combination of managing existing assets, upgrading existing assets and providing new assets. Demand management practices include non-asset solutions, insuring against risks and managing failures.

The expected demand factors are unlikely to result in the need to implement significant changes in water infrastructure development or management beyond the maintenance activities described in this plan. Given budget restrictions and the necessary renewal program, there is no plan to augment the network beyond the changes necessary to achieve the levels of service. Any new land use developments will be responsible for the provision of the water assets necessary to service the project.

5. Lifecycle management plan

The lifecycle management plan details how Council plans to manage and operate the assets at the agreed levels of service while optimising life cycle costs.

5.1. Background data

5.1.1. Data acquisition

To implement an effective WSAMP the Shire must document all background data (asset knowledge) relating to water supply assets. This data is to be recorded in an 'Asset Register' which will provide a data resource (asset inventory) to be utilised in the lifecycle management of assets.

This information is currently being recorded by Shire staff, but in varying forms and is not being uploaded to a centralised asset register. To collate this background data the Shire will investigate the procurement and implementation of a standardised 'field data acquisition document' coupled with GIS mapping of all water supply assets.

In the interim the Shire will develop and trial a standardised hard-copy field data acquisition documentation system to be used during all field activities. This document is to provide a step-by-step guide for completing maintenance, replacement, upgrade and inspection of assets, while recording data such as GPS location, asset ID, photos, standardised condition and risk assessment, areas affected by issue, action taken and for certain assets age, size, and depth.

This document will provide recommended actions for staff to follow by linking back to the appropriate Standard Operating Procedure (SOP), Safe Work Method Statement (SWMS) and Work Health and Safety (WHS) documentation. This data will be uploaded to a centralised asset register on a regular schedule. Following the trial and modification of this hard-copy document, the Shire will investigate developing a digital version to be utilised in-the-field via a field tablet. This will improve the efficiency and accuracy of background data being collated through direct upload to the asset register.

The Shire will continue to utilise GIS mapping to develop an accurate asset register and is currently mapping the location of all water supply assets, collating this information in the MapInfo database. This information is being obtained utilising the recently purchased GNSS Rover system, which is capable of mapping assets with high accuracy (up to 1 cm horizontal). This GIS information will then be linked with its associated data in the asset registered obtained through the field data acquisition document or analysis of old hard copy maps. The aim of linking this information is to produce a detailed map of all water supply assets detailing the exact location and current condition.

It should be noted that with the exception of the Urbenville WTP, all assets are quite old, with the Tenterfield WTP and parts of the reticulation network being over 80 years. Many of these assets are not well documented, in terms of location and condition, and therefore this data needs to be obtained by implementing the above actions.

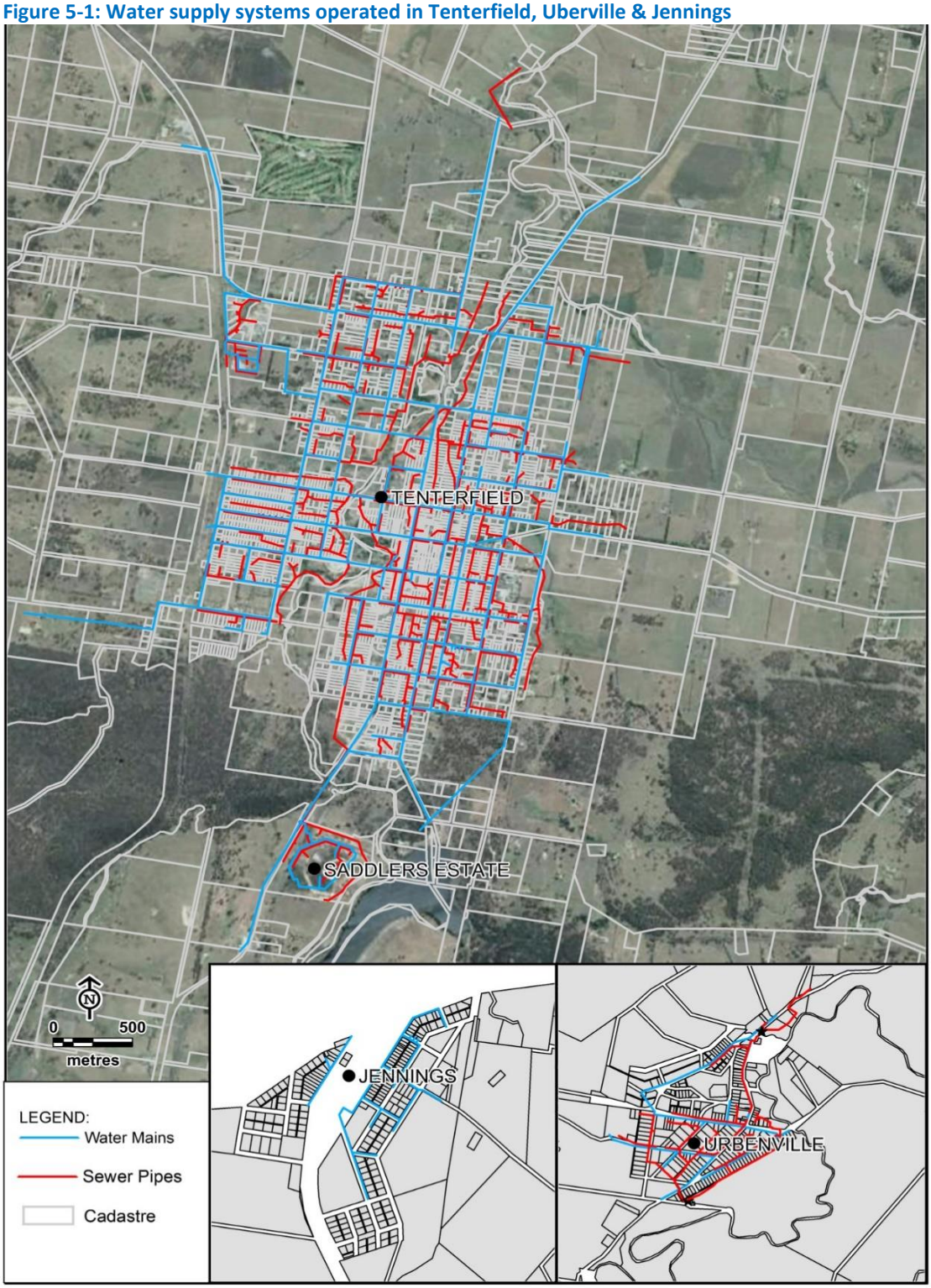
The Shire requires staff capacity to correlate a Water Supply Asset Conditions Manual, including all work as executed plans, specifications, manufacture's guides and operations and maintenance manuals. Presently this information is dispersed throughout various hard copy files and electronic system drives. A complete hard copy version is to be created along with reorganising the electronic drives to enable them to be user friendly and accessible.

A similar exercise is required to harmonise the current Operations & Maintenance Manuals for the WTP's, SOP's, SWMS and manufacturer guides and manuals into one N:/Drive directory repository.

5.1.2. Water supply systems

There are three water supply schemes operated by the Shire in Tenterfield, Urbenville and Jennings and these are shown in Figure 5-1.

Figure 5-1: Water supply systems operated in Tenterfield, Uberville & Jennings



GIS data provided by TSC. Note the data are incomplete.

5.1.3. Tenterfield Water Supply

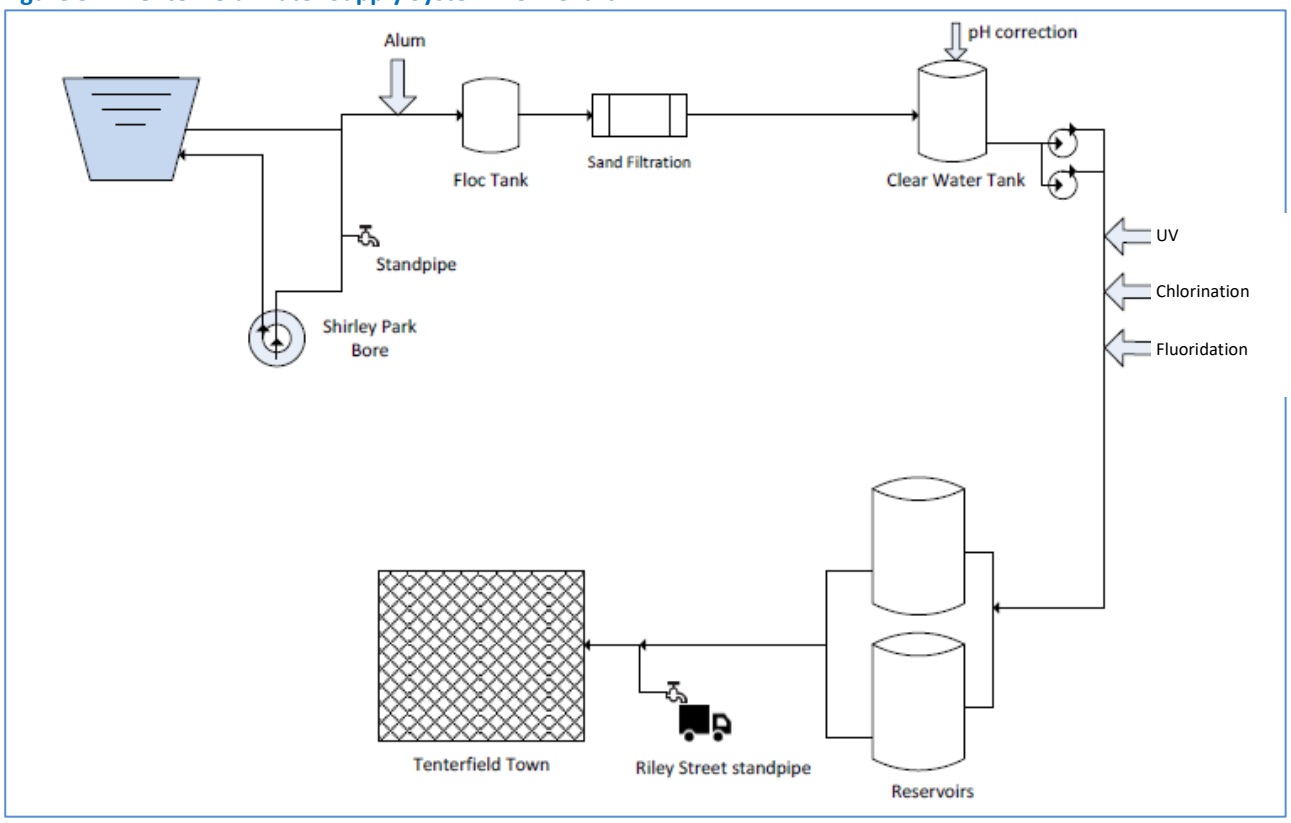
The Tenterfield scheme consists of the Tenterfield Dam, Shirley Park bore, Tenterfield WTP, two service reservoirs and 56 km of water mains. Tenterfield (1,870 connections) is supplied with water from the dam located immediately south of the town on Tenterfield Creek. This concrete dam was built in 1930. The dam wall was raised by 1.8 m and the spillway lengthened in 1974 significantly increasing its capacity. Excavation of the southern storage banks in 2003 under a drought mitigation program provided a further 80 ML of capacity with total water storage of approximately 1,300 ML.

The dam is supplemented by a bore located in Shirley Park which can be piped into both the dam and WTP. The bore can provide a sustainable yield of up to one ML of additional water per day and is licensed to provide up to 160 ML per year.

Raw water is treated at the Tenterfield WTP, built in 1930 and upgraded in 1958 and 1985. Treated water is pumped by a 250 mm main to the primary concrete (2.1 ML) reservoir in East Street and by a series of mains to the western side of Tenterfield.

A supplementary supply for other users, including rural domestic consumers, is available on a fee for service basis via a standpipe located adjacent to the Works Depot in Riley Street and from the Shirley Park bore located in High Street. The Shirley Park bore standpipe is mainly used for stock feed or road watering. The Riley Street standpipe is used by rural customers for drinking and general domestic use and is collected in cubes and water trucks.

Figure 5-2: Tenterfield Water Supply System Flow Chart



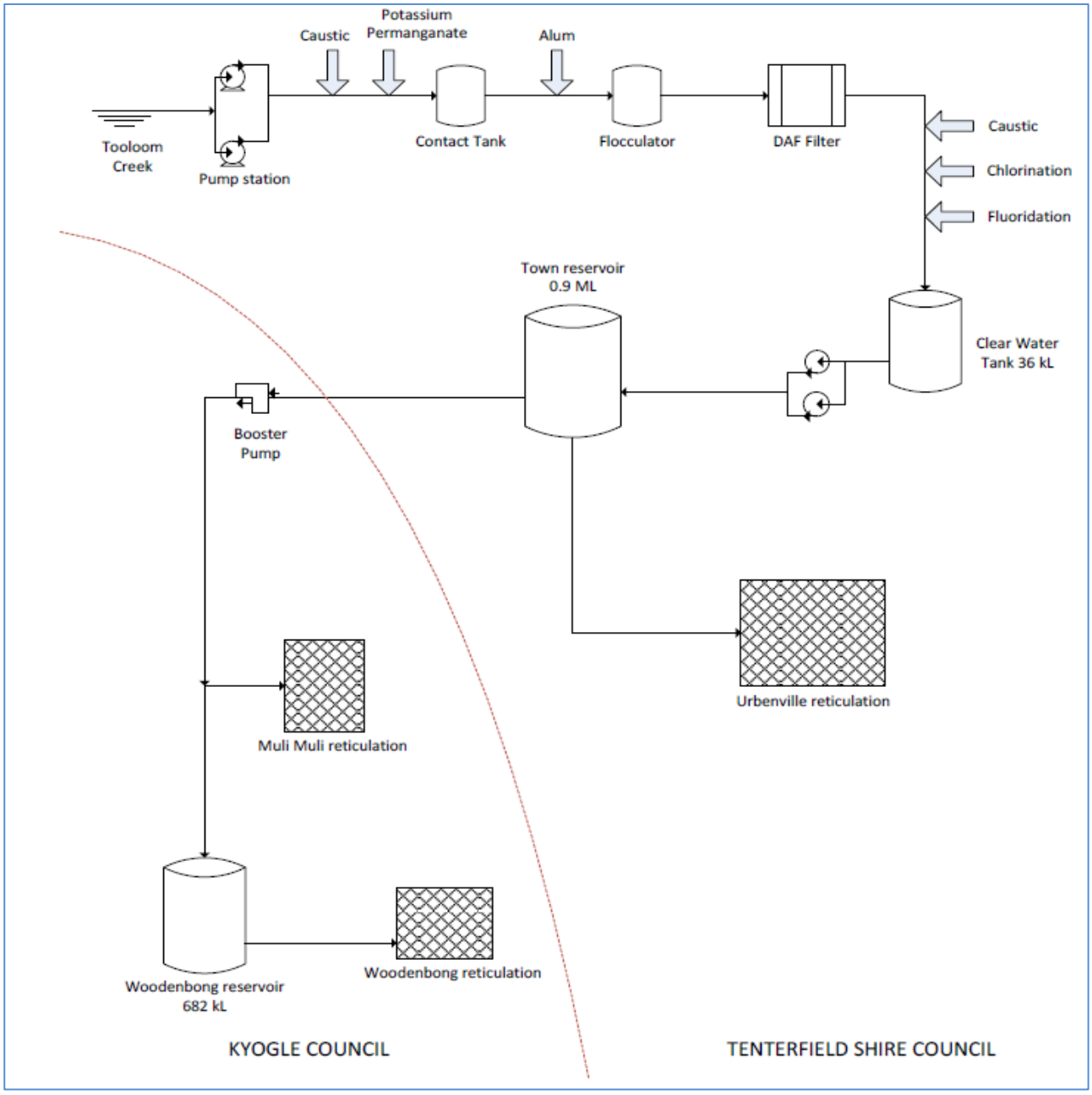
Source: Adapted from Viridis Consultants (2013a)

5.1.4. Urbenville Water Supply

The Urbenville water supply scheme includes the Urbenville WTP, Tooloom Creek Pump Station, one service reservoir and 11 km of water mains (152 connections).

Raw water is sourced through the river intake pump station in Tooloom Creek approximately 4 km west of the village. Water is treated at the Urbenville WTP and then pumped to the Urbenville reservoir for distribution. Bulk water is also supplied to both Woodenbong and Muli Muli by pipeline under a water supply arrangement with Kyogle Council. Muli Muli and Woodenbong are approximately 9 km and 13 km north east of Urbenville respectively.

Figure 5-3: Urbenville Water Supply System Flow Chart

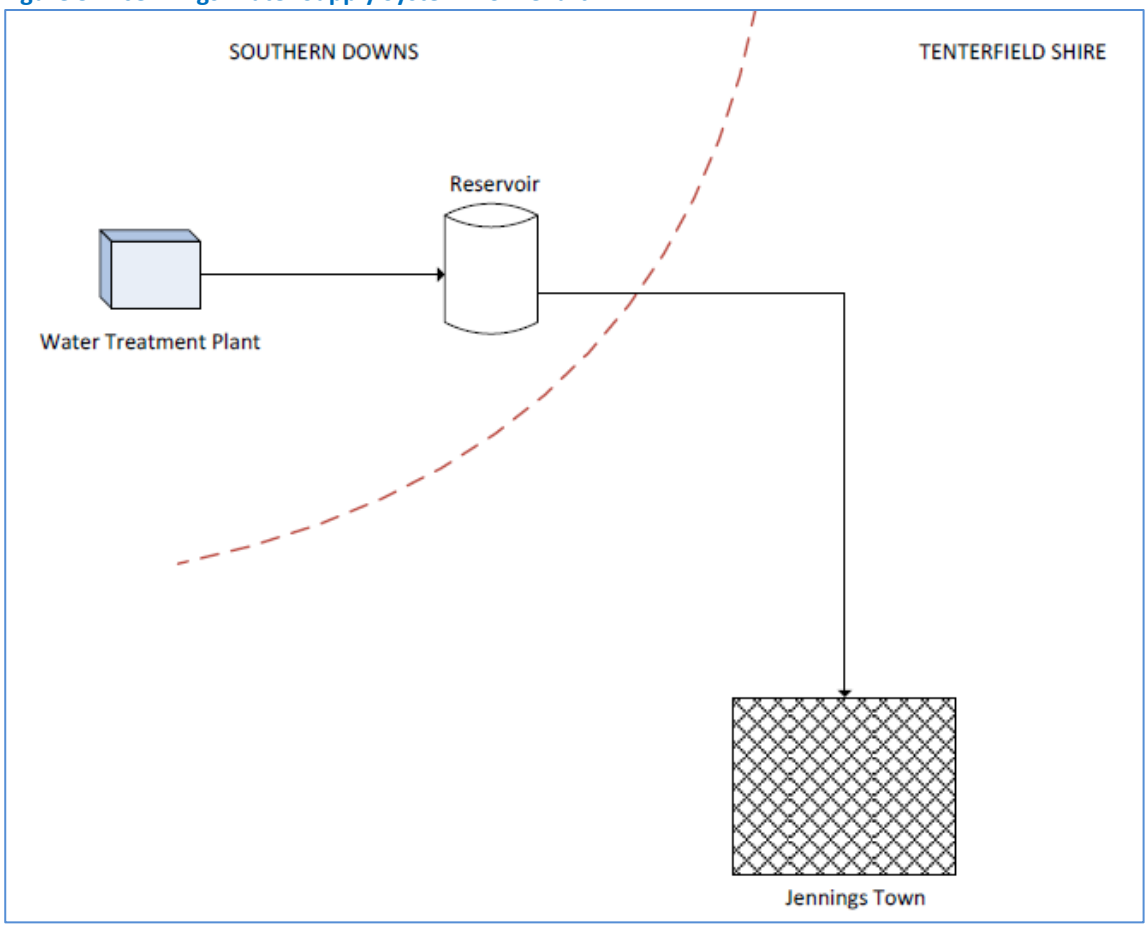


Source: Viridis Consultants (2013a)

5.1.5. Jennings Water Supply

Water is supplied to the Jennings community (84 connections) from the Wallangarra system in Southern Downs Regional Council (SDRC) area in Queensland.

Figure 5-4: Jennings Water Supply System Flow Chart



Source: Viridis Consultants (2013a)

5.1.6. Asset Service Hierarchy

The asset service hierarchy provides a framework for data acquisition and collation within the asset register and WSAMP. The hierarchy provides a tool to assist in the decision making process for scheduling maintenance, renewal and upgrades of assets based on asset criticality to the overall water supply system. Table 5-1 contains a basic asset service hierarchy for the Tenterfield water supply assets, which will be reviewed by the Shire.

Table 5-1: Asset service hierarchy

Critical Asset Rank	Class	Description
1	Dam	Primary raw water supply.
1	WTP	Facility treating raw water to a drinkable standard
2	Raw Water Mains	Transport raw water from the dams/bores to the water treatment plants
2	Trunk Water Mains	Transport water between treatment plants, reservoirs and reticulation network.
2	Reservoirs	Intermediate storage facility (tanks) for the distribution of treated water throughout the reticulation network
2	Fire Hydrants	Direct access points for the local fire departments to reticulation mains
3	Bore	Secondary raw water supply
3	Pump Stations	Pumps water between WTPs, reservoirs or reticulation networks
4	Delivery Mains	Distributes water from reservoirs to the reticulation network
4	Valves	Control water flow throughout the whole water supply network
4	Manholes	Provides access points to water mains
5	Reticulation Network	Distributes water between delivery mains and residential properties
5	Meters	Measure water usage at each residence

5.1.7. Asset capacity and performance

Locations where deficiencies in service performance are known are detailed in Table 5-2. The Shire's services are generally provided to meet Australian design standards where these are available. Service deficiencies are progressively being addressed including:

- Upgrading of Tenterfield Water Supply Dam to reduce risk to the town and continuity of supply. It is in progress and will be completed soon; and
- Upgrade of the Tenterfield WTP where the concept design evaluation is in progress and will proceed depending on funding.
- Jennings Dam wall upgrade and rehabilitation.

Table 5-2: Known service performance deficiencies

Location	Service Deficiency
Reticulation systems	All aged in all systems
Tenterfield WTP	Ageing WTP will need replacement when funding becomes available
Valves and hydrants	Leaking and damaged units identified

5.1.8. Asset Condition

Assessing the condition of water supply assets is an essential part of the decision making process in regard to maintenance, replacement or upgrade of assets. Condition assessment involves the consideration of the current structural integrity and physical characteristics of an asset in an objective manner. This is independent of the standard of service or level of performance required. An indication of asset lifespan can be obtained using an asset condition rating, which in turn assists in the identification of accurate budget requirements to bring assets back to a satisfactory service condition. In order to meet the Auditor's recommendations all conditions assessments of assets must be supported by a documented standardised methodology.

The condition rating assessment of the Shire's water supply assets was last documented as shown in Table 5-3 in the 2016 Special Schedules Report (TSC: 2016). This assessment will be reviewed following the completion of asset mapping and implementation of the 'field data acquisition document', where the asset condition will be recorded for all water supply assets that undergo maintenance, inspection, replacement or upgrade and uploaded to the asset register.

At present no in-house asset condition rating has been utilised, with the majority of current maintenance, replacements or upgrades scheduled based on age and in some cases water flow. The majority of asset condition assessments are conducted and documented using the IIMM condition 1 to 5 grading criteria (1 = Very good, 5 = Poor) as shown in Table 5-3. The application of this system provides a standardised way of recording asset condition and lifespan. As part of this WSAMP, the Shire will develop asset condition criteria for each key asset class listed in the asset service hierarchy.

Table 5-3: Assessment of water supply asset condition

Condition Grading	Description of Condition	% of Asset Value
0	**Not rated**: Could not be rated due to various issues	0%
1	**Very Good**: no work required only planned maintenance	29%
2	**Good:** minor maintenance required plus planned maintenance	55%
3	**Average:** maintenance work required	1%
4	**Poor:** renewal required	15%
5	**Very Poor:** urgent renewal/upgrade required	0%

IIMM description of condition (% Asset Value – Special Schedules Report TSC: 2016a)

Each individual asset in this Plan is to be graded in accordance with its condition. This condition rating is used to value the assets, assess its remaining life and plan for its maintenance. While the specific criteria for each asset varies due to the physical characteristics of the asset class. The generic condition rating will follow the IIMM condition grading methodology as shown in Table 5-3.

The water main asset condition rating adopted by the Shire is shown in Table 5-4 and the other asset conditions will be rated using the IIMM generic system as a basis and shown in Table 5-5.

Table 5-4: Water mains asset condition rating

Grade	Condition	Description	Response	Estimated % Asset Useful Life Remaining
0	Not Rated	Asset has been properly decommissioned, no longer exists (or should be removed), has not been condition rated (or assigned and extrapolated condition), or is unable to be rated due to serviceability issues.	Response will vary subject to circumstances.	NA
1	Very Good	Excellent physical condition. Observable deterioration insignificant. No reported failures of pipeline and zero leaks recorded. In the absence of any other information the asset will be a Condition Grade 1 at an age less than 20% of the design useful life.	Continue with any routine maintenance	100 % to 80 %
2	Good	Sound physical condition; minor or insignificant surface imperfections, corrosion or delamination. Deterioration for this grading restricted to only the protective coating and not to the parent material itself. External coating showing signs of aging (minor). No reported failures of pipeline. In the absence of any other information the asset will be at Condition Grade 2 at an age of between 20 % and 50 % of the design useful life.	Continue with any routine maintenance and any minor repairs	80 % to 50 %
3	Average (Fair to Moderate)	Moderate level of corrosion. Obvious signs of deterioration of pipe wall, and delamination evident. Surface coating damaged or signs of deterioration with some blistering. Some loss of internal diameter in unlined mains (less than 5 %). Joints generally watertight but minor weeping. Some surface softening of AC pipe (less than 5 % of wall thickness). One burst or leak recorded in past 5 years (reticulation main – typically with length less than 200 m). In the absence of any other information the asset will be at Condition Grade 3 at an age of between 50 % and 80 % of the design useful life.	Continue with any routine maintenance and undertake repairs. Investigate reasons for asset deterioration or failure. Take remedial action where appropriate and cost-effective (e.g. improve water treatment, pressure reduction).	50 % to 20 %
4	Poor	Serious level of corrosion. Obvious delamination. Surface coating has deteriorated with blistering occurring. Pipe wall is soft (AC) (less than 25 % of wall thickness). Significant loss of internal diameter of unlined mains (less than 15 %). Joints not watertight allowing some weeping from joints. One failure recorded in current year and failures averaging about one per year over the past 3 years (reticulation main – typically with length less than 200 m). Asset is now moving into zone of failure. In absence of any other information the asset will be at Condition Grade 4 at an age of between 80 % and 95 % of the design useful life.	Identify main as a potential candidate for renewal in the medium term. Review risk mitigation strategies. Monitor main performance and escalate/prioritise for renewal if the failure rate continues to increase.	20 % to 5 %
5	Very Poor	Major deterioration of the structural integrity of the main. Two or more failure recorded per year (reticulation main – typically with length less than 200 m). Significant water leakage.	Take immediate action commensurate with level of risk. Undertake renewal in the short term (< 2 years).	5 % to 0 %

IPWEA 2016

Table 5-5: Water supply asset ratings other than water mains

Condition Grading	Description of Condition
1	Some wear or discolouration but no evidence of damage. Can include repaired assets where the repair is as good as the original. New or near new condition.
2	Deterioration or minor damage that may affect performance. Includes most repaired assets.
3	Asset is damaged affecting performance, but service is still provided. Includes repaired assets where the repair has deteriorated. Clearly needs some attention but is still working. In the case of structures, asset is in need of repair.
4	Either not working or is working poorly because of damage or deterioration. Condition of structure is poor or structural integrity in question.
5	Replace or repair. Needs urgent attention.

5.1.9. Asset valuations

The value of assets recorded in the asset register Table 2-2 and covered in this WSAMP is shown in Table 5-6 and compared to the 2012/13 year. Assets were last revalued in 2016/17. Key financial ratios based on the asset register data are given in Table 5-6 compared to the 2012/13 year.

It is shown in Table 5-7 the Shire has lagged in delivering the critical key financial ratios required to sustain the water supply assets and these assets are still not being renewed at the rate they are being consumed.

To provide services in a financially sustainable manner, the Shire will need to ensure it is renewing assets at the rate they are being consumed over the medium-long term and funding the life cycle costs for all new assets and services in its long term financial plan. Improved data collected as part of this WSAMP will improve the accuracy of these data.

Table 5-6: Water supply asset valuations

Valuation	2012/13 ($'000) WSAMP 2013	2018/19 ($'000)
Current replacement cost (2017)	$39,000	$45,603
Annual depreciation expense (p.a.)	$696	$551*
Accumulated depreciation	$23,202	$27,793*
Depreciated values of assets (Fair Value)	$15,798	$16,347*
10 year renewal budget (p.a.)	$67	$546
10 year capital upgrade budget (p.a.)	$1,125	$705

From Shire AMS p32 & WSAMP 2013

The Fair Value (Written Down Value) has been determined as a function of each asset's condition, the pattern of consumption for each asset class and the replacement value. The cost to return the asset to 'as new' from a given condition has been calculated and then deducted from the replacement value to determine the Fair value.

Table 5-7: Key financial metrics

Ratio	2012/13	2018/19
Asset consumption (depreciation/depreciable amount)	1.8 %	3.4 %
Renewal sustainability (renewal/depreciation)	9.6 %	44 %
Asset renewal (capital renewal/depreciable amount)	0.2 %	2.0 %
Annual upgrade (capital upgrade/depreciable amount)	3.0 %	2.5 %

From Shire AMS p32 & WSAMP 2013

In the Shire's sustainability reporting the rate of annual water supply asset consumption is compared to this asset renewal, upgrade and expansion programs and it is shown it has improved significantly but is still not sustainable.

The Shire is currently renewing assets at lesser rate than they are being consumed each year and is not increasing the size of the asset base in any appreciable way.

To provide services in a financially sustainable manner is to ensure renewing assets is at the rate they are being consumed over the medium-long term. Funding the life cycle costs for all new assets and services is in the Long Term Financial Plan 2017-2017 (Circa: 2017).

5.2. Risk Management Plan

The risk assessment process in Figure 5-5 identifies the Shire's Risk Management Procedure. The Risk Matrix Table 5-8 is used to determine the likelihood of the risk event occurring with historical interpretation with the financial/environmental consequences providing an assessment outcome (1 to 4).

Figure 5-5: Risk management process

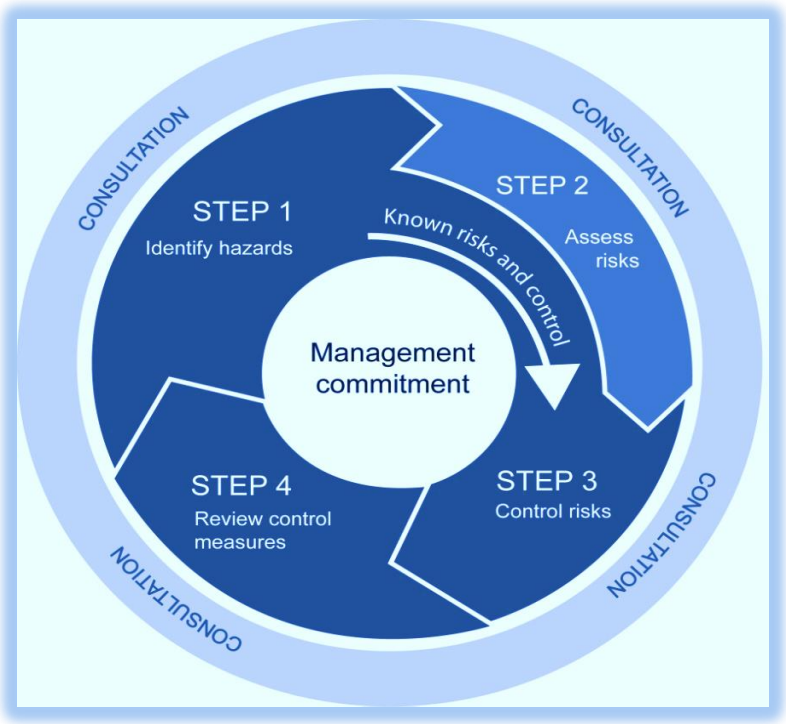


Table 5-8: Risk matrix

				CONSEQUENCE				
Step 1 – Consider the CONSEQUENCES ▪ What are the consequences of this event occurring? ▪ Consider what could reasonably happen with existing controls in place or if an incident has occurred. ▪ Consider what could have reasonably happened as well as what actually happened. ▪ Look at the **CONSEQUENCE** descriptions to the right and choose the most suitable.			**People**	Death or multiple life threatening injuries.	Life threatening injury or serious injuries causing hospitalisation.	Medical treatment required.	First Aid treatment required.	Injuries not requiring First Aid.
Step 2 – Consider the LIKELIHOOD ▪ What is the likelihood of the consequence identified in step 1 happening? ▪ Look at the **LIKELIHOOD** descriptions below and choose the most suitable.			**Environment**	Long term environmental damage.	Environmental damage with potential long term impact	Short term environmental impact.	Environmental impact controlled with existing procedures & equipment.	Minimal environmental impact.
Step 3 – Calculate the RISK ▪ Take the **CONSEQUENCE** rating (*Catastrophic - Insignificant*) and select the correct column. ▪ Take the **LIKELIHOOD** rating (*Almost Certain – Rare*) and select the correct row. ▪ Select the **RISK** rating where the two ratings cross on the matrix to the right.			**Financial**	or Greater than $100,000	or $50,000 to $99, 999	or $10,000 to $49,999	or <$1,500 to $9,999	or Less than $1,500
	Numerical:	**Historical:**		**Catastrophic**	**Major**	**Medium**	**Minor**	**Insignificant**
LIKELIHOOD	>1 in 10 Times	Incident is expected to occur in most circumstances.	**Almost Certain**	**4**	**4**	**4**	**3**	**3**
	1 in 10 Times	Incident will probably occur in most circumstances.	**Likely**	**4**	**4**	**3**	**3**	**3**
	1 in 100 Times	Incident could occur at some time.	**Possible**	**4**	**3**	**3**	**2**	**2**
	1 in 1,000 Times	Incident is not likely to occur in normal circumstances.	**Unlikely**	**3**	**3**	**3**	**2**	**2**
	1 in 10,000 Times	Incident may only occur in exceptional circumstances.	**Rare**	**3**	**3**	**2**	**2**	**1**

Assessment Outcome	
Very Low Risk (1):	No additional control measures necessary. Continue to monitor risk.
Low Risk (2):	Controls measures must be implemented to reduce risk.
Medium Risk (3):	Risk unacceptable; do not proceed without control measures, minimum of 'engineering control measures'.
High Risk (4):	Risk unacceptable; do not proceed without control measures, minimum of 'elimination or substitution control measures'.

Transfer the calculated risk of the hazard (1), (2), (3) or (4) to the risk assessment column on the Safe Work Method Statement

An assessment of risks associated with service delivery and water supply assets has identified critical risks resulting in loss or reduction in service from infrastructure assets or a 'financial shock' to the Shire, as undertaken as part of the development of the Drinking Water Management Strategy. However, this type of assessment is yet to be directly applied to the water supply assets.

A risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, applies a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks. The risk assessment process using the Shire's Risk Matrix (Circa: 2015) as shown in Table 5-8 is used to undertake the water supply asset specific infrastructure critical impact risk Table 5-9, resulting in loss or reduction in service from the assets and potentially financially catastrophic to the Shire.

Table 5-9: Critical impact risks

Factor	Catastrophic	Major	Moderate	Minor	Insignificant
Environmental & legal	Council sued or fined or otherwise liable for more than $20M	Council sued or fined or otherwise liable for $5M - $20M	Council sued or fined or otherwise liable for $250K - $5M	Council sued or fined or otherwise liable for up to $250K	Council prosecuted for minor offence
	Catastrophic environmental damage of national importance. Prosecution. Long term study. Impact permanent.	Serious environmental damage of national importance. Prosecution. Long term study. Impact not completely reversible.	Serious environmental damage of national importance. Prosecution expected. Impacts reversible within 10 years	Serious environmental damage of local importance. Prosecution expected. Impacts reversible within 1 year	Minor localised environmental damage. Prosecution possible. Impact completely reversible within 3 months
Service Delivery	Water supply outage for several weeks or longer	Water supply outage for one week	Water supply outage for a reticulation network for one day	Water supply outage for a section of the reticulation network for one day	
		Water supply contaminated			
	Permanent loss of facility	Public amenity closed for 1 month or more	Public amenity closed for 2 or more	Public amenity closed for 1 to 2 weeks	Public amenity closed for less than 1 week
				Systematic customer complaints, or complaints relating to more than one issue	Isolated costumer complaints
				Repeated service standard failure or one that affects multiple people	Isolated service standard failure
Financial	Unplanned loss or cost to reinstate of $3M or greater	Unplanned loss or cost to reinstate of between $1.75M - $3M	Unplanned loss or cost to reinstate of between $1M - $1.75M	Unplanned loss or cost to reinstate of between $500K - $1M	Unplanned loss or cost to reinstate less than $500K
	Ongoing loss of $400K p.a.	Ongoing loss of $200K - $400K p.a.	Ongoing loss of $100K - $200K p.a.		

Factor	Catastrophic	Major	Moderate	Minor	Insignificant
Community Health & Safety		People in the majority of the reticulation network ill through contaminated water or similar	People in several sections of the reticulation network ill through contaminated water or similar	People in a small section of the reticulation network ill through contaminated water or similar	Several people ill through contaminated water or similar
	Multiple loss of life or city-wide epidemic	Loss of life or widespread long-term hospitalisation required	Hospitalisation required	Medical treatment required	
		Dissatisfaction of community measure needs to be included			

Critical risks are those assessed as catastrophic and possible requiring immediate corrective action and major and possible as identified in Table 5-10 requiring tailored prioritised corrective action for each specific event and asset class.

Table 5-10: Critical risks and treatment plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Treatment Costs	Operations & Maintenance Activities
Jennings Dam Wall	Break	4	Design and construction of new/upgraded wall/spillway	$2.5M	Daily inspection
East St Reservoir	Cracks widen	3	Line with poly liner	$100,000	Daily inspection
Tenterfield WTP	Unable to treat water to public health requirements	3	Plan to construct new WTP if funding becomes available	$5.5M	Daily sampling & testing; In-line monitoring; Drinking water management system;
Urbenville Raw Water Turbidity & WTP	Breakthrough into treated water	3	Install inline high turbidity plant shutdown	$10,000	Daily sampling & testing; In-line monitoring; Drinking water management system;

5.3. Operation & Routine Maintenance Plan

Routine maintenance is the regular on-going work necessary to keep assets operating, including where elements of the asset fail and require immediate repair to keep it performing and operational.

Operations activities affect service levels including quality and availability of drinking water. Operations activities include sampling and testing, adjusting chemical dosing rates, checking dam levels and monitoring water use. Standard Operating Plans (SOPs) have been developed and are to be reviewed and updated on an annual basis.

SOP procedures have been documented for:

- Dam level recording;
- Recording Pump Hours and Volumes;
- PAC and Soda Ash Inspections and Top Ups;
- WTP Sampling;
- WTP Testing;
- WTP Backwash Procedure;
- WTP Ground Maintenance;
- WTP Timesheets/Log Book;
- Written Report;
- Hydrant and Valve Maintenance;
- Dam Scour Valve Operation;
- Draining Water From Sludge Dam;
- Pumping Sludge to Geo-Bag;
- Valve Replacement or Mains Repairs;
- Installation and Repair of Water Service;
- Cleaning Settlement Tank;
- Refilling ALCHOR Container;
- Fluoride Top-Up;
- Chlorine Gas Replacement;
- Water Meter Check; and
- Replacing Filter Media.

The Shire will operate and maintain water supply assets to provide the defined level of service to approved budgets in the most cost-efficient manner. The operation and maintenance activities include:

- Scheduling operations activities to deliver the defined level of service in the most efficient manner;
- Undertaking maintenance activities through a planned maintenance system to reduce maintenance costs and improve maintenance outcomes. Undertake cost-benefit analysis to determine the most cost-effective split between planned and unplanned maintenance activities;
- Maintain a current infrastructure risk register for assets and present service risks associated with providing services from infrastructure assets and reporting Very High and High risks and residual risks after treatment to management and Council;
- Review current and required skills base and implement workforce training and development to meet required operations and maintenance needs;
- Review asset utilisation to identify underutilised assets and appropriate remedies, and over utilised assets and customer demand management options;
- Maintain a current hierarchy of critical assets and required operations and maintenance activities;
- Develop and regularly review appropriate emergency response capability; and
- Review management of operations and maintenance activities to ensure Council is obtaining best value for resources used.

5.3.1. Maintenance plan

The maintenance plan includes all actions necessary for retaining an asset at as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating such as water main break repairs and pump servicing.

Maintenance may be classified into reactive, planned and specific maintenance work activities. Reactive maintenance is unplanned repair work carried out in response to service requests and management/supervisory directions. Planned maintenance is repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure/breakdown experience, prioritising scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance. Specific maintenance is replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including repainting, replacing air conditioning units, etc. This work falls below the capital/maintenance threshold but may require a specific budget allocation.

Reactive maintenance is unplanned repair work carried out in response to service requests and management/supervisory directions. This maintenance occurs due to asset failures.

Planned maintenance is repair work identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure/breakdown experience, prioritising, scheduling, actioning the work and reporting what was done to develop a maintenance history, improve maintenance and service delivery performance.

Specific maintenance is replacement of higher value components or sub-components of assets undertaken on a regular cycle such as repainting, replacing air conditioning units and replacing componentry. This work falls below the capital/maintenance threshold but may require a specific budget allocation.

Future operations and maintenance expenditure is forecast to remain constant in real terms into the future. Maintenance is funded from the operating budget and grants where available.

Table 5-11 lists the general maintenance and inspection schedule applied to all key asset classes. As part of the on-going improvement of this Plan the schedule will be reviewed and updated based on condition and risk assessment data in order to maintain and operate these assets in a financially sustainable manner.

Table 5-11: Water supply maintenance & inspection schedule

Class	Maintenance/Inspection Schedule
Dam	General visual inspection – completed daily
Bore	Currently not operational
Raw Water Mains	No routine inspections scheduled due to access issues
WTP	Daily
Trunk Water Mains	No routine inspections scheduled due to access issues
Reservoirs	Weekly
Pump Stations	General inspection and data collection – completed weekly Mechanical servicing of pumps – completed every six months
Reticulation Mains	No routine inspections scheduled due to access issues
Manholes	No routine inspections scheduled Last inspection completed in 2013
Fire Hydrants	No routine inspections scheduled Tenterfield Fire & Rescue currently conducting an inspection and condition assessment
Valves	No routine inspections scheduled
Meters	General inspection – completed every six months

Forecast budget maintenance and operations expenditure is shown in Table 5-12 and the expenditure trend in Figure 5-6. It is noted the Shire has increased the annual budgets substantially in the forecast 10 year period.

Table 5-12: Water supply expenditure forecast

Expenditure Forecast	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
	$ x 1,000									
Renewals of Asset	$444	$445	$504	$568	$644	$352	$519	$536	$544	$545
New Assets	$2,005	$5,000	$5	$0	$16	$41	$16	$0	$5	$0
WTP Tenterfield						#$6,000				
Total New & Renewals	**$2,439**	**$5,445**	**$509**	**$568**	**$660**	**$6,393**	**$535**	**$536**	**$549**	**$545**
Maintenance & Operations	$1,961	$1,926	$1,996	$2,220	$2,223	$2,259	$2,267	$2,378	$2,366	$2,417

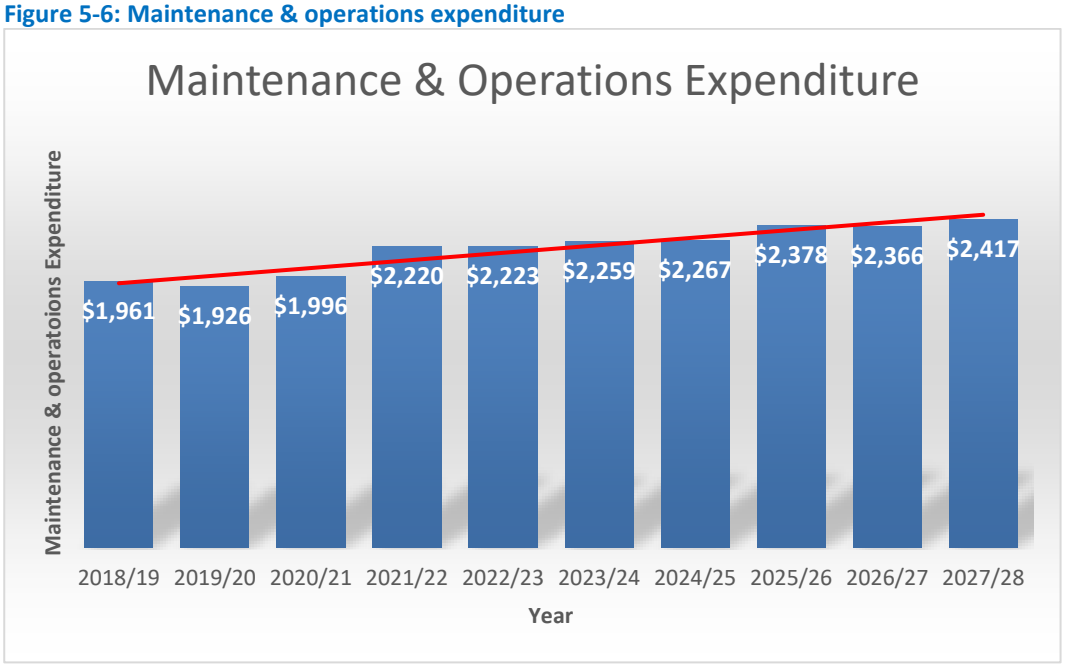
From Shire accounts for 2018-19 budget working document (# subject to possible external funding or loans)

Once the mapping of existing water supply assets is completed and the asset register updated with the condition and risk assessment data for all water supply assets, the Shire will develop a more informed and detailed annual maintenance plan.

Any maintenance work on an asset will be recorded against the asset, which can then be used to identify high maintenance assets that would be more cost-effective to renewal.

The goal of this plan will be to allocate funding and field-time to bring all assets back to a satisfactory standard and maintain this level of condition from there on.

Figure 5-6: Maintenance & operations expenditure



From Shire accounts for 2018-19 budget working document

5.3.2. Standards and specifications

Operation and maintenance will be completed in accordance with the following standards and specifications:

- WSAA 2003 Water Supply Code;
- AUSSPEC;
- NSW Code of Practice for Plumbing and Drainage;
- Tenterfield Water Treatment Plant Operations & Maintenance Manual;
- Manufacturer guides and manuals for specific devices;
- Standard Operation Procedures (SOPs) and Safe Work Method Statements (SWMS);
- Work, Health and Safety (WH&S) Procedures; and
- Council staff are provided with job specific training when required.

5.4. Renewal and replacement plan

Renewal expenditure is major work, which does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original service potential.

Work over and above restoring an asset to original service potential is an upgrade or expansion and is new work expenditure. Examples include replacement of an existing reticulation main with the same size, replacement of existing pumps and components with same capacity, replacement of sludge Geotube with same capacity and replacing filter bed material.

Low cost renewal such as mains relining is recognised by adding the renewal cost to the existing asset and reviewing the remaining useful life of the renewed asset to restore the economic benefits to the Shire.

A detailed renewal/replacement plan is yet be finalised and documented in detail identifying the asset condition and risk assessment. This data will be used to schedule asset renewals and replacements.

All assets rated as condition grade 4 or 5 will be scheduled for renewal or replacement, with level 5 targeted first. These assets will be scheduled in order based on their risk factor, with 'Very High Risk' assets scheduled first.

The Shire's Asset Renewal Plan is the forward programmed renewal of assets, which are used to predict expenditure requirements within the Long Term Financial Plan 2017-27. The current Residual Life of the asset identifies the date of renewal.

There are three basic methods for determining the Asset Residual Life:

1. The Asset estimated Useful Life minus the Asset Age.
2. A condition based assessment to determine the residual life.
3. A combination of Asset Age and condition assessment

Method 1: uses historical records which identify asset acquisition dates and from the estimated useful life a first estimate of residual life can be made.

Method 2: the condition based assessment utilises extensive inspection and a professional assessment using nationally accepted condition criteria. This method is by far the best option, however, to condition rate all the assets on a regular basis is beyond Council's available resources.

Method 3: utilises a combination of both methods, it identifies assets of condition 1 on an age based assessment, eliminating them from the inspection program. From the age profile the oldest assets will be identified and will be condition rated by an inspection program as funds permit.

Early defect identification by condition assessment may enable major maintenance works to extend the asset life before renewal is required.

5.4.2. The asset expected useful life

The Tenterfield Shire Council Accounting Policy has listed the accepted estimates of Useful Life. The minimum estimated useful life of various asset types are listed in Table 5-13

Table 5-13: Asset useful life

Asset Type	Useful Life (years)
Water Treatment Plant Structure	70
Water treatment Plant Mechanical	20
Tenterfield Dam Structure	100
Tenterfield Dam Mechanical	25
Water Reticulation	50-80
Water Meters	15

The relationship between condition rating, useful life and residual life uses Method 3 as discussed in Section 4 and is shown in Table 5-14.

Table 5-14: Asset useful life by condition rating

Condition	Maximum Residual Service Life (Years)			
	Useful life – 125	Useful life – 80 years	Useful life – 60 years	Useful life – 40 years
1	70	40	30	20
2	50	30	25	15
3	20	20	15	10
4	5	5	5	5
5	1	1	1	1

The measure of the Shire's Asset Management Performance is the Sustainability Index, which is the percentage of the 10 year average of the Maintenance, Operations & Renewal Budget over the 10 year average of Depreciation, operations and maintenance budget. The sustainability index for Tenterfield Shire Council's water system is currently 44%.

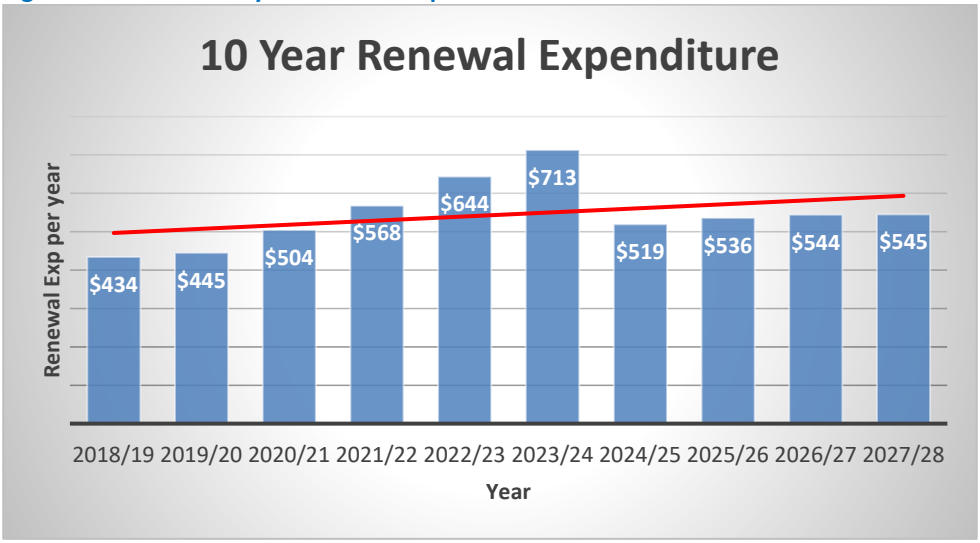
5.4.1. Projected renewal expenditure

Projected future renewal expenditures are forecast to increase over time as the assets age. The forecast costs and available budgets are summarised in Figure 5-7.

Note all costs are shown in 2018 dollar values. The projected capital renewal program in strategic dollars is in the Asset Management Strategy 2017-27, with program requirements in the Delivery Program 2017-21 and details in the Operational Plan 2018-19 working financial analysis. Note the financials in the AMS 2017-27 do not match the 2018-19 working financial analysis. It is important to understand the renewal program as articulated in the Asset Management Strategy 2017-27 and Delivery Program 2017-21 is to complete works necessary to maintain existing levels of service, rather than projects funded using existing budgets.

A copy of the current identified program is in Appendix A.

Figure 5-7: Forecast 10year renewal expenditure



From Shire accounts for 2018-19 budget working document

5.5. New works plan

New works are those works that create a new asset that did not previously exist, or works which upgrade or improve an existing asset beyond its existing capacity. They may result from growth, asset end of useful life, social or environmental needs. This includes new assets such as a WTP and upgrade of the Tenterfield dam wall. Assets may also be acquired at no cost to Council from land development.

New assets and upgrade/expansion of existing assets are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with other organisations. Candidate proposals are inspected to verify need and to develop a preliminary renewal estimate. Verified proposals are ranked by priority and available funds and scheduled in future works programs. A copy of the current identified program is in Appendix A. The priority ranking criteria is detailed in Table 5-14.

Table 5-15: New asset priority ranking

Criteria	Weighting
Public health	40%
Public safety	40%
Public request	15%
Network extension	5%

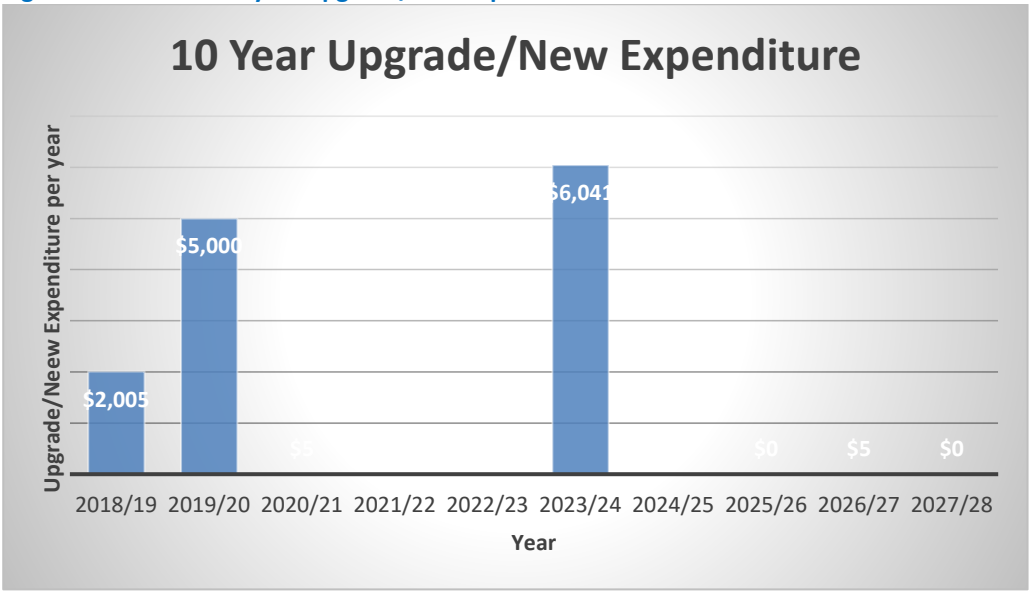
The expenditure profile for upgrades/new works is shown in Figure 5-8 including the completion of the Tenterfield dam wall project, the Jennings Dam wall project and the projected Tenterfield WTP Project as yet unfunded. There are a number of significant new capital upgrade projects identified for the next 10 years including:

- Upgrade of Tenterfield Dam wall as part of flood risk management and is currently being completed;
- The upgrade of the Jennings dam wall pending external funding availability and this has been included in the model as it is listed in the 10 year forward estimates.
- The construction of a New WTP - Tenterfield pending external funding availability and this has been included in the model, even though it is not listed in the 10 year forward estimates.
  Currently the finalisation of the feasibility options study and solution selection is still to be concluded. A project management plan, communications plan and RFT are required for the engagement of consultants for the design and contract documentation.
  A further RFQ is required for the EIS and Heritage requirements for the project and managing the approvals processes from various state and federal government departments and agencies.

The resolution of funding for the project is still to be finalised. This could be by way of government grants and loan funds.

It is considered at least up to three years will be required before the project will be shovel ready

Figure 5-8: Forecast 10year upgrade/new expenditure



From Shire accounts for 2018-19 budget working document

5.6. Disposal plan

Disposal is a decommissioned asset including sale, demolition or relocation. No assets have been identified as available for disposal at this time.

6. Financial summary

6.1. Financial context

This Section contains a summary of the financial requirements discussed in previous sections of the Plan. The financial projections will be improved as further information becomes available on desired levels of service, current and projected future asset performance, along with external funding acquisitions for major project works.

There are three key indicators for financial sustainability considered in the analysis of the services provided by this asset category. These are long term life cycle costs/expenditures and medium term projected/budgeted expenditures over 5 and 10 years of the planning period.

This WSAMP identifies the projected operations, maintenance and capital renewal expenditure required to provide an agreed level of service to the community over a 10 year period. These projected figures are directly related to the current forward budget program working documents used to develop the Operations Plan for 2018-19. It is noted the operations and maintenance figures in the Asset Management Strategy 2017-27 and LTFP 2017-27 do not align with this analysis. It is also noted the forward project replacement of the Tenterfield WTP is not listed within the current 10 year forward capital program articulated in the working documents for 2018-19. This project has been included within this analysis.

The Shire has undertaken financial modelling as part of the water supply strategic business planning strategy in December 2015, where 30 year financial plans were prepared for water supply. The NSW Financial Planning Model (FINMOD) was used to prepare this water business strategic financial plans.

The aim of the financial modelling was to:

- Meet the funding requirements of the capital works program and other life-cycle costs associated with system assets;
- Ensure an appropriate level of cash and liquidity; and
- Forecast the pricing structure over the long term.

The main output of the strategic financial plan is the *Typical Residential Bill (TRB),* which is the annual bill paid by a non-pensioner residential customer using the average amount of water supply. The plans set out the long term price path (Typical Residential Bills) the Shire will need to levy in order to fund the recurrent cost and capital investment required for deliver the levels of service set out in the strategic business plan.

FINMOD provides a 30-year projection of the financial statements (income statement, balance sheet and cash flow statement). The financial statements are included in the Strategic Business Plan for Water Supply & Sewerage Services (Hydro: Dec 2015).

This model excluded administration costs, loan repayments, interest, staff costs and depreciation and is not considered a realistic set of figures. The model also retained current figures (2015/16) for maintenance and operations and inflated figures for renewals and upgrades. The model has informed the Shire's 10 year forward estimates yearly profile, however, the whole expenditure costs have been included.

The total forecast capital and recurrent expenditure is shown in Table 5-12 and is reiterated below:

Table 6-1: Water supply expenditure forecast

Expenditure Forecast	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
	$ x 1,000									
Renewals of Asset	$444	$445	$504	$568	$644	$352	$519	$536	$544	$545
New Assets	$2,005	$5,000	$5	$0	$16	$41	$16	$0	$5	$0
WTP Tenterfield						#$6,000				
Total New & Renewals	**$2,439**	**$5,445**	**$509**	**$568**	**$660**	**$6,393**	**$535**	**$536**	**$549**	**$545**
Maintenance & Operations	$1,961	$1,926	$1,996	$2,220	$2,223	$2,259	$2,267	$2,378	$2,366	$2,417

From Shire accounts for 2018-19 budget working document and includes administration costs, loan repayments, interest, staff costs and depreciation (# subject to possible external funding or loans)

6.2. Life cycle costs

6.2.1. Long-Term Lifecycle Cost

Life cycle costs (or whole of life costs) are the average costs required to sustain the service levels over the longest asset life. Life cycle costs include operations and maintenance expenditure and asset consumption (depreciation expense).

The life cycle cost for the services covered in this WSAMP is $2,752M per year (average of operations and maintenance expenditure plus depreciation expense over the 10 year period).

Life cycle costs can be compared to life cycle expenditure to give an indicator of sustainability in service provision. Life cycle expenditure includes operations, maintenance and capital renewal expenditure. Life cycle expenditure will vary depending on the timing of asset renewals. The life cycle projected expenditure over the 10 year period of the plan is $3,455M with funding for major projects (operations and maintenance expenditure plus budgeted capital renewal expenditure).

However, taking out the major projects of the Dam Wall for Jennings, the Tenterfield WTP and the residual expenditure on the Tenterfield Dam project, the life cycle projected expenditure would be an average of $2,278M.

A shortfall between life cycle cost and life cycle expenditure is the life cycle gap. The life cycle gap for services covered by this WSAMP is $474K per year assuming budgeted renewal and maintenance amounts are achievable in any budget year. Life cycle expenditure is 83% of life cycle costs.

The life cycle costs and life cycle expenditure comparison highlights any difference between present outlays and the average cost of providing the service over the long term. If the life cycle expenditure is less than the life cycle cost, it is most likely outlays will need to be increased or cuts in services made in the future.

Knowing the extent and timing of any required increase in outlays and the service consequences if funding is not available will assist the Shire in providing services to the community in a financially sustainable manner. This is the purpose of the WSAMP 2018 and long term financial plan (LTFP 2017-27).

The long-term lifecycle cost will be reviewed as part of this WSAMP following the accurate documentation of all assets and their current condition.

This indicates the Shire is budgeting for the projected operations, maintenance and some of the renewal expenditures needed to provide the services documented in the asset management plan, but there is a forecast shortfall.

However Council does not have funds available for the upgrade program and will need to fund this through loans and/or Government subsidies.

6.3. Funding Strategy

Projected expenditure identified in Section 6.1 and Table 5-12 cannot be funded from existing operating and capital budgets. Available funding will determine the extent to which the capital shortfall is addressed, and resultant required funding options to be considered to maintain this critical asset infrastructure.

Without a substantial injection of funding from the State or Federal Governments through the funding programs available the Shire cannot sustain its asset service delivery.

The funding strategy is detailed in the Shire's Strategic Business Plan for water Supply and Sewerage Services 2015, Asset Management Strategy 2017-27, Long Term Financial Plan 2017-27, Program Delivery Plan 2017-21 and yearly Operations Plan 2018-19.

6.3.1. Valuation Forecasts

Asset values are forecast to increase as additional assets are added to the asset stock from construction and acquisition by the Shire and from assets constructed by land developers, other third parties and gifted.

The depreciated replacement cost (current replacement cost less accumulated depreciation) will vary over the forecast period depending on the rates of addition of new assets, disposal of old assets and consumption and renewal of existing assets.

Providing services in a sustainable manner will require matching of projected asset renewals to meet agreed service levels with planned capital works programs and available revenue. A gap between projected asset renewals, planned asset renewals and funding indicates that further work is required to manage required service levels and funding to eliminate any funding gap.

The Shire will manage the 'gap' by developing this asset management plan to provide guidance on future service levels and resources required to provide these services, and review future services, service levels and costs with the community.

6.4. Key assumptions made in financial forecasts

This Section details the key assumptions made in presenting the information contained in this asset management plan and in preparing forecasts of required operating and capital expenditure and asset values, depreciation expense and carrying amount estimates. It is presented to enable readers to gain an understanding of the levels of confidence in the data behind the financial forecasts.

Key assumptions made in this asset management plan are:

- Considerable further work is required to determine the asset conditions and to create an accurate asset register;
- The variable financial information embedded with various Shire published documents is confusing and not comparable due to the inclusions and exclusions in each set of figures;
- The sample of assets condition rated are a representation of the overall asset data base;
- The age of the assets recorded in the Asset Management database are a true representation of the actual construction date;
- The industry practice sstandards for useful life of assets predicts the true useful life; and
- Additional funding will be required from the State and Federal Governments for major future projects.

7. Asset management practices

7.1. Accounting/financial systems

7.1.1. Accounting and financial systems

The Shire uses Synergysoft, which is an integrated accounting, finance and records management system. Synergysoft was implemented in 2014.

7.1.2. Accountabilities for financial systems

The Chief Corporate Officer is responsible for the control of Council's accounting systems.

7.1.3. Accounting standards and regulations

Australia Accounting Standards (AASB116 & AASB136) local Government, code of accounting practice and financial reporting, Council's accounting policy, the local government Act (LGA) and regulations.

In accordance with asset capitalisation policy expenditure, which has benefit expected to last more than twelve month should be capitalised. Capital expenditure includes renewal, expansion and upgrade.

7.1.4. Capital and maintenance threshold

The aim of the capitalisation policy is to set a capitalisation threshold above which assets are required to be recorded by the Shire in its financial statements. The process for this is the capitalisation process and is achieved by the recording the capital cost of the acquisition of assets into Council's financial system and then into the asset management system.

7.1.5. Required changes to accounting financial systems arising from this WSAMP

At present the water supply engineering asset management system is not linked with the accounting system. This is due to the fact that a suitable AMS is yet to be procured. The goal is to link these two systems or incorporate the accounting data within the newly selected asset management software. The Shire will need to ultimately invest in an automated predictive Asset Management System like that offered by SMEC to help interrogate asset data by optimising modelling of different funding scenarios and examining implications.

Currently there is inherent risk in differing financial indicators from the two systems with multiple staff involved with the management of the data systems creating confusion and inconsistencies. This will be managed over the next 2 years on filling staff vacancies and the use of one set of data by the Engineering and Finance teams.

7.2. Asset management systems

7.2.1. Asset management system

Due to the limitations of the SynergySoft asset management module, the Shire needs to work towards implementing a new asset management system. As part of this process is to prepare a RFT to supply, install and provide training for an asset management software (system). This aims to find an asset management system including an asset register, allowing for predictive modelling and assessment of the asset data to inform decision-making and allow for maintenance and renewal programs to be developed for future works programs and budgets.

The selected system will need to be compatible with the in-house GIS software (MapInfo©) or have its own GIS functionality, while having portable capabilities to be utilised on mobile devices such as tables and smartphones, to allow for in the field documentation of asset condition and maintenance. The selection and implementation of an asset management system will be a vital step in executing and developing this WSAMP.

In the past the Shire utilised the Conquest Asset Management module of Authority's enterprise Business System provided by Civica. As a result of the change in the Shire's Business System from Authority to Synergy, asset information has slowly been integrated into Synergy. This is not complete as yet.

The current Asset Management System for water supply is described in the Asset Management Strategy 2017-2027 (Circa: 2017). The system used by the Shire is the IPWEA International Infrastructure Manual System and the Asset Management Guidelines for Water Supply and Sewerage Schemes and the Condition Assessment & Asset Performance Guidelines.

Council subscribes to NAMSPLUS3, which is the IPWEA initiative for LG to develop asset management planning and the templates have been used to develop the asset management plans.

7.2.2. Asset registers

As part of the 'Background Data' collation process the asset register will be further developed by the Shire. This asset register, when completed, will contain the location, condition and relative information of all water supply assets.

This information will be recorded within a spreadsheet document or MapInfo© until a new AMS is deployed and the data uploaded into this new system. This register will provide the key information required in developing an appropriate WSAMP with the goal of bring all assets back to a 'satisfactory' standard.

7.2.3. Accountabilities for asset management system and data

The Accounting officer is responsible for updating the Synergysoft system. The Manager Water & Waste is responsible for ensuring data in N:\drive Water Asset Registers is accurate and concords with those in Synergysoft.

7.2.4. Required changes to asset management system arising from this AM Plan

Improved integration of the Engineering Asset Registers and the asset management components managed by Finance is required. It is anticipated when the asset management module of Synergysoft is fully implemented there will be improved integration.

7.3. Information flow requirements and processes

The key information flows *into* this asset management plan are:

- The Integrated Planning & Reporting System
- The Shire's strategic and operational plans
- Service requests from the community
- Water supply assets information
- Updated condition surveys and interrogation of the overall asset data
- The frequent updates of estimates and unit rates for categories of work and materials
- Current levels of service, expenditures, service deficiencies and service risks
- Projections of various factors affecting future demand for services and new assets acquired

- Future capital works programs
- Financial asset values

The key information flows *from* this asset management plan:

- Underpin the Delivery Program 2017-2021
- Establish the programs within the annual Operational Plan
- The projected long term capital works programs
- The Long Term Financial Plan expenditure projections
- Financial sustainability indicators.

7.4. Strategies, standards and guidelines

Strategies, standards, guidelines and policy documents referenced in this Asset Management Plan are:

- Integrated Planning & Reporting Framework Office of Local Government
- Integrated Planning & Reporting Manual for Local Government In NSW -2013
- Community Engagement Strategy (TSC:2017)
- Community Strategic Plan 2017-2027 (TSC: 2017)
- Delivery Program 2017-2021 (TSC:2017)
- Operational Plan 2018-2019 (TSC:2018)
- Workforce Management Strategy 2017-2021(TSC:2017)
- Long Term Financial Plan 2017-2027 (TSC:2017)
- Tenterfield Shire Council Policy 1.014 – Asset Management
- Asset Management Strategy 2017-2027 (TSC:2017)
- Strategic Business Plan for Water and Sewerage Services (Hydro: 2015)
- Draft Water Supply Asset Management Plan (Hydro: 2016) now superseded
- Water Supply Asset Management Plan (TSC:2013) now superseded
- Asset Data Spreadsheets in N:\drive
- Standard Operating Procedures
- Tenterfield Water Treatment Plant Operations & Maintenance Manual (TSC: 2015)
- Tenterfield WTP Concept Design (MJM: 2016)
- IPWEA International Infrastructure Manual System.
- International Infrastructure Management Manual (IIMM) – 2015

8. Plan improvement and monitoring

8.1. Performance measures

The effectiveness of the Water Supply Asset Management Plan can be measured as follows:

- All elements of the current strategies and plans developed as part of the Shire's Integrated Planning and Reporting System are incorporated into this WSAMP 2018;
- The harmonisation of the cash flow analysis in this Plan into the Shire's Asset Management Strategy 2017-2027 and Long Term Financial Plan 2017-2027 as guided by the Community Strategic Plan 2017-2027;
- The validation of the delivery outputs of the annual Operational Plan and four year Delivery Program compared to the trends as forecast in this WSAMP 2018.
- The acquisition and implementation of a new asset management software system and the review of all mapping, asset data and programs as per Table 8-2 Part B.

8.2. Improvement plan

The improvement plan is shown in Table 8-1 and Table 8-2 it is in two parts. The first part are the actions to be completed in the short term to improve the water supply asset management within the current engineering governance regime and the second part are the actions after a new asset management system is procured and deployed.

Table 8-1 Improvement plan – Part A

Task No	Task	Responsibility	Resources Required	Timeline
1A	Complete GIS mapping of all water supply assets and upload to in-house GIS software.	Manager Water & Waste	Senior Service Operator Technical Projects Officer	June 2019
2A	Develop, implement and review a hard copy version of the 'Field Data Acquisition Document' for the field data gathering process (Section 5.1.1).	Manager Water & Waste	Senior Service Operator Technical Projects Officer	June 2019
3A	Develop, implement and review of the 'Field Data Acquisition Document' by using Excel spreadsheets. (Section 5.1.1).	Manager Water & Waste	Senior Service Operator Technical Projects Officer	June 2019
4A	Review and develop an asset register using Excel spreadsheets from the field data acquisition document and other relevant resources (Section 5.1.2).	Manager Water & Waste	Senior Service Operator Technical Projects Officer	June 2019
5A	Produce a water supply asset map containing accurate GPS locations for all key assets, with links to current condition data (Section 5.1.1).	Manager Water & Waste	Senior Service Operator Technical Projects Officer	June 2021
6A	Review and update the asset services hierarchy with all key asset classes (Section 5.1.6).	Manager Water & Waste	Manager Water & Waste	June 2020
7A	Review and develop the asset condition assessment ratings for all other key asset classes (Section 4.1.5).	Manager Water & Waste	Manager Water & Waste	June 2019
8A	Complete a risk assessment on all documented water supply assets (Section 4.2).	Manager Water & Waste	Manager Water & Waste	June 2019
9A	Review and update asset maintenance and operational plans based on condition and risk assessment data, taking into account life cycle cost data (Section 5.2).	Manager Water & Waste	Manager Water & Waste	June 2020
10A	Review and update the renewal/replacement plan based on condition and risk assessment data, taking into account life cycle cost data (Section 5.4).	Manager Water & Waste	Manager Water & Waste	June 2020
11A	Review and update the creation/ acquisition/ upgrade plan based on condition and risk assessment data, taking into account life cycle cost data (Section 5.4.1).	Manager Water & Waste	Manager Water & Waste	June 2020
12A	Continually review model and update the financial plan with updated estimates and revaluations, asset condition changes and maintenance cost increases (Section 5) and asset schedule.	Manager Water & Waste	Manager Water & Waste	Yearly as part of budget

Table 8-2 Improvement plan – Part B – post asset management software system implementation

Task No	Task	Responsibility	Resources Required	Timeline
1B	Purchase appropriate field equipment and utilise to trial and review the digital version of the 'Field Data Acquisition Document' (Section 5.1.1).	Manager Water & Waste	Manager Water & Waste	November 2019
2B	Identify, procure, implement and obtain training for an Asset Management Software System (Section 7.2.1)	Manager Water & Waste	Manager Water & Waste	After acquisition of new system
3B	Trial implementation for an Asset Management Software System (Section 7.2.1)	Manager Water & Waste	Senior Service Operator	After acquisition of new system
4B	Develop, implement and review a digital version of the 'Field Data Acquisition Document' (Section 5.1.1).	Manager Water & Waste Senior Service Operator	Manager Water & Waste Senior Service Operator	After acquisition of new system
5B	Review and develop a digital asset register using the data obtained from the field data acquisition document and other relevant resources (Section 5.1.1).	Manager Water & Waste Senior Service Operator	Manager Water & Waste Senior Service Operator	After acquisition of new system
6B	Undertake a sensitivity analysis model review and update asset maintenance and operational plans based on condition and risk assessment data, taking into account life cycle cost data (Section 5.4).	Manager Water & Waste	Manager Water & Waste	After acquisition of new system
7B	Review and update the renewal/replacement plan based on condition and risk assessment data, taking into account life cycle cost data (Section 4.4).	Manager Water & Waste	Manager Water & Waste	After acquisition of new system
8B	Undertake a sensitivity analysis model review and update the creation/ acquisition/ upgrade plan based on condition and risk assessment data, taking into account life cycle cost data (Section 5.4).	Manager Water & Waste	Manager Water & Waste	After acquisition of new system
9B	Continually review model and update the financial plan with updated estimates and revaluations, asset condition changes and maintenance cost increases (Section 5) and asset schedule.	Manager Water & Waste	Manager Water & Waste	After acquisition of new system & Yearly as part of budget

8.3. Monitoring and review procedures

This Water Supply Asset Management Plan 2018 will be reviewed during the development of the annual Operational Plan and amended to recognise any changes in service levels and/or resources available to provide those services as a result of the annual budget decision process.

The WSAMP 2018 has a life of 4 years and is due for revision and updating at the time the four year Delivery Program reviewed.

9. References

- IPWEA, 2015, *International Infrastructure Management Manual*, Institute of Public Works Engineering Australia, Sydney, www.ipwea.org.au.
- IPWEA, 2008, *NAMS.PLUS Asset Management* Institute of Public Works Engineering Australia, Sydney, www.ipwea.org.au/namsplus
- IPWEA, 2009, *Australian Infrastructure Financial Management Guidelines*, Institute of Public Works Engineering Australia, Sydney, www.ipwea.org.au/AIFMG.
- IPWEA, 2011, *International Infrastructure Management Manual*, Institute of Public Works Engineering Australia, Sydney, www.ipwea.org.au.
- IPWEA 2016, *Condition Assessment & Asset Performance Guidelines – Water Supply and Sewerage*, Institute of Public Works Engineering Australia, Sydney, www.ipwea.org.au.
- Integrated Planning & Reporting Framework Office of Local Government http://www.olg.nsw.gov.au/councils/integrated-planning-and-reporting/framework
- Integrated Planning & Reporting Manual for Local Government in NSW -2013 http://www.olg.nsw.gov.au/councils/integrated-planning-and-reporting/framework

Following Tenterfield Shire documents can be found on:

https://www.tenterfield.nsw.gov.au/council/council-documents/plans-and-reports/integrated-planning-reporting-2018

- Community Engagement Strategy (TSC:2017)
- Community Strategic Plan 2017-2027 (TSC: 2017)
- Delivery Program 2017-2021 (TSC:2017)
- Operational Plan 2018-2019 (TSC:2018)
- Workforce Management Strategy 2017-2021(TSC:2017)
- Long Term Financial Plan 2017-2027 (TSC:2017)
- Tenterfield Shire Council Policy 1.014 – Asset Management
- Asset Management Strategy 2017-2027 (TSC:2017)

N:\drive\04 Water and Waste\05 Water

- Strategic Business Plan for Water and Sewerage Services (Hydrosphere: 2015)
- Draft Water Supply Asset Management Plan (Hydrosphere: 2016) now superseded
- Water Supply Asset Management Plan (TSC:2013) now superseded
- Asset Data Spreadsheets in N:\drive
- Standard Operating Procedures
- Tenterfield Water Treatment Plant Operations & Maintenance Manual (TSC: 2015)
- Tenterfield WTP Concept Design (MJM: 2016)

Following Tenterfield Shire Council documents can be found as designated:

- Tenterfield Shire Council Integrated Water Cycle Management Evaluation Study and Strategy Plan (Hydrosphere: 2013)
- Tenterfield Shire Council Strategic Business Plan for Water Supply and Sewerage Services (Hydrosphere: 2015)
- Demand Projection Review – Tenterfield WTP (MJM: 2015)
- Expression of Interest: Supply, Installation and Training – Asset Management Software Solution, Tenterfield Shire Council Engineering Services, October 2016.
- Special Schedules Report, Tenterfield Shire Council (TSC: 2016)
- Tenterfield Shire Council Risk Assessment Briefing Paper (Viridis: 2013)

10. Appendices

Appendix A Projected 10 year Capital Renewal & New Works Program

Refer to:

- Asset Management Strategy 2017-27 (TSC: 2017)
- Long term Financial Plan 2017-27 (TSC: 2017)
- Program Delivery Program 2017-21 (TSC: 2017)
- AssetVal Valuation Schedule 2017 attached

Project priorities and estimates to be checked after the procurement and implementation of a new asset management modelling system.

Appendix B Abbreviations

Appendix C Glossary

10.1. Appendix A: Projected 10 year capital renewal & new works program

Project priorities and estimates to be checked after the procurement and implementation of a new asset management modelling system.

Capital Renewal & New/Upgrade Works Program

Projects	Account Reference		Y1 2018/19	Y2 2019/20	Y3 2020/21	Y4 2021/22	Y5 2022/23	Y6 2023/24	Y7 2024/25	Y8 2025/26	Y9 2026/27	Y10 2027/28
Sludge Removal	7484 500	R	$ -	$ -	$ -	$ -	$ -	$ 10,000	$ -	$ -	$ -	$ -
Tenterfield Mains Augmentation	7484 501	N	$ -	$ -	$ -	$ -	$ 10,900	$ -	$ 11,200	$ -	$ -	$ -
Valve Renewal	7484 502	R	$ -	$ -	$ -	$ -	$ -	$ 50,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
Tenterfield Mains Replacement	7484 505	R	$ 262,700	$ 269,300	$ 276,000	$ 282,900	$ 290,000	$ 297,300	$ 304,700	$ 312,300	$ 312,300	$312,300
Meter Replacement	7484 506	R	$ 21,000	$ 21,500	$ 22,000	$ 22,600	$ 23,200	$ 23,800	$ 24,400	$ 25,000	$ 25,000	$ 25,000
UV Disinfection System	7484 511	N	$ -	$ -	$ -	$ -	$ -	$ 21,000	$ -	$ -	$ -	$ -
Air Scour - Pipe Renewal Program	7484 514	R	$ -	$ -	$ -	$ -	$ 60,000	$ -	$ -	$ -	$ -	$ -
Flood Warning System (Gas Bubler)	7484 515	R	$ 16,800	$ 17,200	$ 17,600	$ 18,000	$ 18,500	$ 19,000	$ 19,500	$ 20,000	$ 20,000	$ 20,000
Shirley Park Bore Flood Damage Restoration	7484 516	R	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000
Mains Extension Urbenville	7484 801	N	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -
Meter Replacement	7484 802	R	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -
Valve/Hydrant Replacement	7484 803	R	$ -	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -
SCADA Renewal	7484 812	R	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Meter Replacement	7484 900	R	$ -	$ -	$ -	$ -	$ -	$ 10,000	$ -	$ -	$ -	$ -
Mains Replacement	7484 901	R	$ 10,600	$ 10,900	$ 11,200	$ 11,500	$ 11,800	$ 12,100	$ 12,400	$ 12,700	$ 12,700	$ 12,700
Tenterfield Dam Wall Construction	7484 513	N	$ 2,000,000	$ 2,500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Jennings Dam Wall Construction	7484 525	R	$ -	$ 2,500,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Water Treatment Plant Design	7484 521	R	$ -	$ -	$ -	$ -	$ -	$ 500,000	$ -	$ -	$ -	$ -
Water Treatment Plant Construct	7484 522	R	$ -	$ -	$ -	$ -	$ -	$ 5,500,000	$ -	$ -	$ -	$ -
Urbenville Water Treatment Plant	7484 811	N	$ 5,000	$ -	$ 5,000	$ -	$ 5,000	$ -	$ 5,000	$ -	$ 5,000	$ -
Loan Repayments (Urb Water)	7484 980	R	$ 10,732	$ 11,438	$ 12,139	$ 12,989	$ 13,843	$ 14,754	$ 15,683	$ 16,756	$ 17,858	$ 19,033
Loan Repayments (Dam Wall)	7484 981	R	$ 110,258	$ 112,823	$ 113,733	$ 116,031	$ 116,804	$ 120,350	$ -	$ -	$ -	$ -
Loan Repayments (Treatment Plant)	7484 982	R	$ -	$ -	$ 49,110	$ 102,309	$ 108,014	$ 114,036	$ 120,394	$ 127,108	$ 134,194	$134,194
New Capital Expenditure		N	$ 2,005,000	$ 5,000,000	$ 5,000	$ -	$ 15,900	$ 6,041,000	$ 16,200	$ -	$ 5,000	$ -
Renewal Capital Expenditure		R	$ 444,090	$ 445,000	$ 503,782	$ 568,330	$ 644,192	$ 713,000	$ 519,077	$ 535,864	$ 544,052	$545,227
CAPITAL EXPENDITURE - Total			**$ 2,439,090**	**$ 5,445,000**	**$ 508,782**	**$ 568,330**	**$ 660,062**	**$ 6,754,340**	**$ 535,277**	**$ 535,864**	**$ 549,052**	**$545,227**

10.2. Appendix B Abbreviations

AAAC	Average annual asset consumption
ADWG	Australian Drinking Water Guidelines
AMP	Asset Management Plan
AMS	Asset Management System
CSP	Community Strategic Plan
FINMOD	Financial Planning Model
IPWEA	Institute of Public Works Engineering Australia
IIMM	International Infrastructure Management Manual
IRMP	Infrastructure risk management plan
LCC	Life Cycle cost
LCE	Life cycle expenditure
MMS	Maintenance management system
SOP	Standard Operation Procedure
SWMS	Safe Work Method Statement
TRB	Typical Residential Bill
TSC	Tenterfield Shire Council
WH&S	Work, Health and Safety
WSAA	Water Services Association of Australia
WTP	Water Treatment Plant

10.3. Appendix C Glossary

Annual service cost (ASC)

1) Reporting actual cost

The annual (accrual) cost of providing a service including operations, maintenance, depreciation, finance/opportunity and disposal costs less revenue.

2) For investment analysis and budgeting

An estimate of the cost that would be tendered, per annum, if tenders were called for the supply of a service to a performance specification for a fixed term. The Annual Service Cost includes operations, maintenance, depreciation, finance/ opportunity and disposal costs, less revenue.

Asset

A resource controlled by an entity as a result of past events and from which future economic benefits are expected to flow to the entity. Infrastructure assets are a sub-class of property, plant and equipment which are non-current assets with a life greater than 12 months and enable services to be provided.

Asset class

A group of assets having a similar nature or function in the operations of an entity, and which, for purposes of disclosure, is shown as a single item without supplementary disclosure.

Asset condition assessment

The process of continuous or periodic inspection, assessment, measurement and interpretation of the resultant data to indicate the condition of a specific asset so as to determine the need for some preventative or remedial action.

Asset management (AM)

The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner.

Average annual asset consumption (AAAC)*

The amount of an organisation's asset base consumed during a reporting period (generally a year). This may be calculated by dividing the depreciable amount by the useful life (or total future economic benefits/service potential) and totalled for each and every asset OR by dividing the carrying amount (depreciated replacement cost) by the remaining useful life (or remaining future economic benefits/service potential) and totalled for each and every asset in an asset category or class.

Borrowings

A borrowing or loan is a contractual obligation of the borrowing entity to deliver cash or another financial asset to the lending entity over a specified period of time or at a specified point in time, to cover both the initial capital provided and the cost of the interest incurred for providing this capital. A borrowing or loan provides the means for the borrowing entity to finance outlays (typically physical assets) when it has insufficient funds of its own to do so, and for the lending entity to make a financial return, normally in the form of interest revenue, on the funding provided.

Capital expenditure

Relatively large (material) expenditure, which has benefits, expected to last for more than 12 months. Capital expenditure includes renewal, expansion and upgrade. Where capital projects involve a combination of renewal, expansion and/or upgrade expenditures, the total project cost needs to be allocated accordingly.

Capital expenditure - expansion

Expenditure that extends the capacity of an existing asset to provide benefits, at the same standard as is currently enjoyed by existing beneficiaries, to a new group of users. It is discretionary expenditure, which increases future operations and maintenance costs, because it increases the organisation's asset base, but may be associated with additional revenue from the new user group, eg. extending a drainage or road network, the provision of an oval or park in a new suburb for new residents.

Capital expenditure - new

Expenditure which creates a new asset providing a new service/output that did not exist beforehand. As it increases service potential it may impact revenue and will increase future operations and maintenance expenditure.

Capital expenditure - renewal

Expenditure on an existing asset or on replacing an existing asset, which returns the service capability of the asset up to that which it had originally. It is periodically required expenditure, relatively large (material) in value compared with the value of the components or sub-components of the asset being renewed. As it reinstates existing service potential, it generally has no impact on revenue, but may reduce future operations and maintenance expenditure if completed at the optimum time, eg. resurfacing or resheeting a material part of a road network, replacing

a material section of a drainage network with pipes of the same capacity, resurfacing an oval.

Capital expenditure - upgrade

Expenditure, which enhances an existing asset to provide a higher level of service or expenditure that will increase the life of the asset beyond that which it had originally. Upgrade expenditure is discretionary and often does not result in additional revenue unless direct user charges apply. It will increase operations and maintenance expenditure in the future because of the increase in the organisation's asset base, eg. widening the sealed area of an existing road, replacing drainage pipes with pipes of a greater capacity, enlarging a grandstand at a sporting facility.

Capital funding

Funding to pay for capital expenditure.

Capital grants

Monies received generally tied to the specific projects for which they are granted, which are often upgrade and/or expansion or new investment proposals.

Capital investment expenditure

See capital expenditure definition

Capitalisation threshold

The value of expenditure on non-current assets above which the expenditure is recognised as capital expenditure and below which the expenditure is charged as an expense in the year of acquisition.

Carrying amount

The amount at which an asset is recognised after deducting any accumulated depreciation / amortisation and accumulated impairment losses thereon.

Class of assets

See asset class definition

Component

Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality.

Cost of an asset

The amount of cash or cash equivalents paid or the fair value of the consideration given to acquire an asset at the time of its acquisition or construction, including any costs necessary to place the asset into service. This includes one-off design and project management costs.

Current replacement cost (CRC)

The cost the entity would incur to acquire the asset on the reporting date. The cost is measured by reference to the lowest cost at which the gross future economic benefits could be obtained in the normal course of business or the minimum it would cost, to replace the existing asset with a technologically modern equivalent new asset (not a second hand one) with the same economic benefits (gross service potential) allowing for any differences in the quantity and quality of output and in operating costs.

Depreciable amount

The cost of an asset, or other amount substituted for its cost, less its residual value.

Depreciated replacement cost (DRC)

The current replacement cost (CRC) of an asset less, where applicable, accumulated depreciation calculated on the basis of such cost to reflect the already consumed or expired future economic benefits of the asset.

Depreciation / amortisation

The systematic allocation of the depreciable amount (service potential) of an asset over its useful life.

Economic life

See useful life definition.

Expenditure

The spending of money on goods and services. Expenditure includes recurrent and capital.

Fair value

The amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties, in an arm's length transaction.

Funding gap

A funding gap exists whenever an entity has insufficient capacity to fund asset renewal and other expenditure necessary to be able to appropriately maintain the range and level of services its existing asset stock was originally designed and intended to deliver. The service capability of the existing asset stock should be determined assuming no additional operating revenue, productivity improvements, or net financial liabilities above levels currently planned or projected. A current funding gap means service levels have already or are currently falling. A projected funding gap if not addressed will result in a future diminution of existing service levels.

Heritage asset

An asset with historic, artistic, scientific, technological, geographical or environmental qualities that is held and maintained principally for its contribution to knowledge and culture and this purpose is central to the objectives of the entity holding it.

Impairment Loss

The amount by which the carrying amount of an asset exceeds its recoverable amount.

Infrastructure assets

Physical assets that contribute to meeting the needs of organisations or the need for access to major economic and social facilities and services, eg. roads, drainage, footpaths and cycleway. These are typically large, interconnected networks or portfolios of composite assets. The components of these assets may be separately maintained, renewed or replaced individually so that the required level and standard of service from the network of assets is continuously sustained. Generally the components and hence the assets have long lives. They are fixed in place and are often have no separate market value.

Investment property

Property held to earn rentals or for capital appreciation or both, rather than for:

(a) use in the production or supply of goods or services or for administrative purposes; or

(b) sale in the ordinary course of business.

Key performance indicator

A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction.

Level of service

The defined service quality for a particular service/activity against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental impact, acceptability and cost.

Life Cycle Cost

Total LCC The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.

Average LCC The life cycle cost (LCC) is average cost to provide the service over the longest asset life cycle. It comprises annual operations, maintenance and asset consumption expense, represented by depreciation expense. The Life Cycle Cost does not indicate the funds required to provide the service in a particular year.

Life Cycle Expenditure

The Life Cycle Expenditure (LCE) is the actual or planned annual operations, maintenance and capital renewal expenditure incurred in providing the service in a particular year. Life Cycle Expenditure may be compared to average Life Cycle Cost to give an initial indicator of life cycle sustainability.

Loans / borrowings

See borrowings.

Maintenance

All actions necessary for retaining an asset as near as practicable to its original condition, including regular ongoing day-to-day work necessary to keep assets operating, e.g. road patching but excluding rehabilitation or renewal. It is operating expenditure required to ensure that the asset reaches its expected useful life.

Planned maintenance

Repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure/breakdown criteria/experience, prioritising scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.

- Reactive maintenance

Unplanned repair work that is carried out in response to service requests and management/supervisory directions.

- Significant maintenance

Maintenance work to repair components or replace sub-components that needs to be identified as a specific maintenance item in the maintenance budget.

- Unplanned maintenance

Corrective work required in the short-term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.

Maintenance and renewal gap

Difference between estimated budgets and projected required expenditures for maintenance and renewal of assets to achieve/maintain specified service levels, totalled over a defined time (e.g. 5, 10 and 15 years).

Maintenance and renewal sustainability index

Ratio of estimated budget to projected expenditure for maintenance and renewal of assets over a defined time (e.g. 5, 10 and 15 years).

Maintenance expenditure

Recurrent expenditure, which is periodically or regularly required as part of the anticipated schedule of works required to ensure that the asset achieves its useful life and provides the required level of service. It is expenditure, which was anticipated in determining the asset's useful life.

Materiality

The notion of materiality guides the margin of error acceptable, the degree of precision required and the extent of the disclosure required when preparing general purpose financial reports. Information is material if its omission, misstatement or non-disclosure has the potential, individually or collectively, to influence the economic decisions of users taken on the basis of the financial report or affect the discharge of accountability by the management or governing body of the entity.

Modern equivalent asset

Assets that replicate what is in existence with the most cost-effective asset performing the same level of service. It is the most cost efficient, currently available asset which will provide the same stream of services as the existing asset is capable of producing. It allows for technology changes and, improvements and efficiencies in production and installation techniques

Net present value (NPV)

The value to the organisation of the cash flows associated with an asset, liability, activity or event calculated using a discount rate to reflect the time value of money. It is the net amount of discounted total cash inflows after deducting the value of the discounted total cash outflows arising from e.g. the continued use and subsequent disposal of the asset after deducting the value of the discounted total cash outflows.

Non-revenue generating investments

Investments for the provision of goods and services to sustain or improve services to the community that are not expected to generate any savings or revenue to the Council, eg. parks and playgrounds, footpaths, roads and bridges, libraries, etc.

Operations expenditure

Recurrent expenditure, which is continuously required to provide a service. In common use the term typically includes, e.g. power, fuel, staff, plant equipment, on-costs and overheads but excludes maintenance and depreciation. Maintenance and depreciation is on the other hand included in operating expenses.

Operating expense

The gross outflow of economic benefits, being cash and non-cash items, during the period arising in the course of ordinary activities of an entity when those outflows result in decreases in equity, other than decreases relating to distributions to equity participants.

Pavement management system

A systematic process for measuring and predicting the condition of road pavements and wearing surfaces over time and recommending corrective actions.

PMS Score

A measure of condition of a road segment determined from a Pavement Management System.

Rate of annual asset consumption

A measure of average annual consumption of assets (AAAC) expressed as a percentage of the depreciable amount (AAAC/DA). Depreciation may be used for AAAC.

Rate of annual asset renewal

A measure of the rate at which assets are being renewed per annum expressed as a percentage of depreciable amount (capital renewal expenditure/DA).

Rate of annual asset upgrade

A measure of the rate at which assets are being upgraded and expanded per annum expressed as a percentage of depreciable amount (capital upgrade/expansion expenditure/DA).

Recoverable amount

The higher of an asset's fair value, less costs to sell and its value in use.

Recurrent expenditure

Relatively small (immaterial) expenditure or that which has benefits expected to last less than 12 months. Recurrent expenditure includes operations and maintenance expenditure.

Recurrent funding

Funding to pay for recurrent expenditure.

Rehabilitation

See capital renewal expenditure definition above.

Remaining useful life

The time remaining until an asset ceases to provide the required service level or economic usefulness. Age plus remaining useful life is useful life.

Renewal

See capital renewal expenditure definition above.

Renewal sustainability

The proportion of the annual depreciation expense that is covered by renewal of assets = Renewal Expense / Annual Depreciation Cost.

Residual value

The estimated amount that an entity would currently obtain from disposal of the asset, after deducting the estimated costs of disposal, if the asset were already of the age and in the condition expected at the end of its useful life.

Revenue generating investments

Investments for the provision of goods and services to sustain or improve services to the community that are expected to generate some savings or revenue to offset operating costs, e.g. public halls and theatres, childcare centres, sporting and recreation facilities, tourist information centres, etc.

Risk management

The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.

Section or segment

A self-contained part or piece of an infrastructure asset.

Service potential

The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset. A measure of service potential is used in the not-for-profit sector/public sector to value assets, particularly those not producing a cash flow.

Service potential remaining

A measure of the future economic benefits remaining in assets. It may be expressed in dollar values (Fair Value) or as a percentage of total anticipated future economic benefits. It is also a measure of the percentage of the asset's potential to provide services that is still available for use in providing services (Depreciated Replacement Cost/Depreciable Amount).

Strategic Longer-Term Plan

A plan covering the term of office of councillors (4 years minimum) reflecting the needs of the community for the foreseeable future. It brings together the detailed requirements in the council's longer-term plans such as the asset management plan and the long-term financial plan. The plan is prepared in consultation with the community and details where the council is at that point in time, where it wants to go, how it is going to get there, mechanisms for monitoring the achievement of the outcomes and how the plan will be resourced.

Specific Maintenance

Replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including repainting, building roof replacement, cycle, replacement of air conditioning equipment, etc. This work generally falls below the capital/ maintenance threshold and needs to be identified in a specific maintenance budget allocation.

Sub-component

Smaller individual parts that make up a component part.

Useful life

Either:

(a) the period over which an asset is expected to be available for use by an entity, or

(b) the number of production or similar units expected to be obtained from the asset by the entity.

It is estimated or expected time between placing the asset into service and removing it from service, or the estimated period of time over which the future economic benefits embodied in a depreciable asset, are expected to be consumed by the council.

Value in Use

The present value of future cash flows expected to be derived from an asset or cash generating unit. It is deemed to be depreciated replacement cost (DRC) for those assets whose future economic benefits are not primarily dependent on the asset's ability to generate net cash inflows, where the entity would, if deprived of the asset, replace its remaining future economic benefits.


Creating a living environment